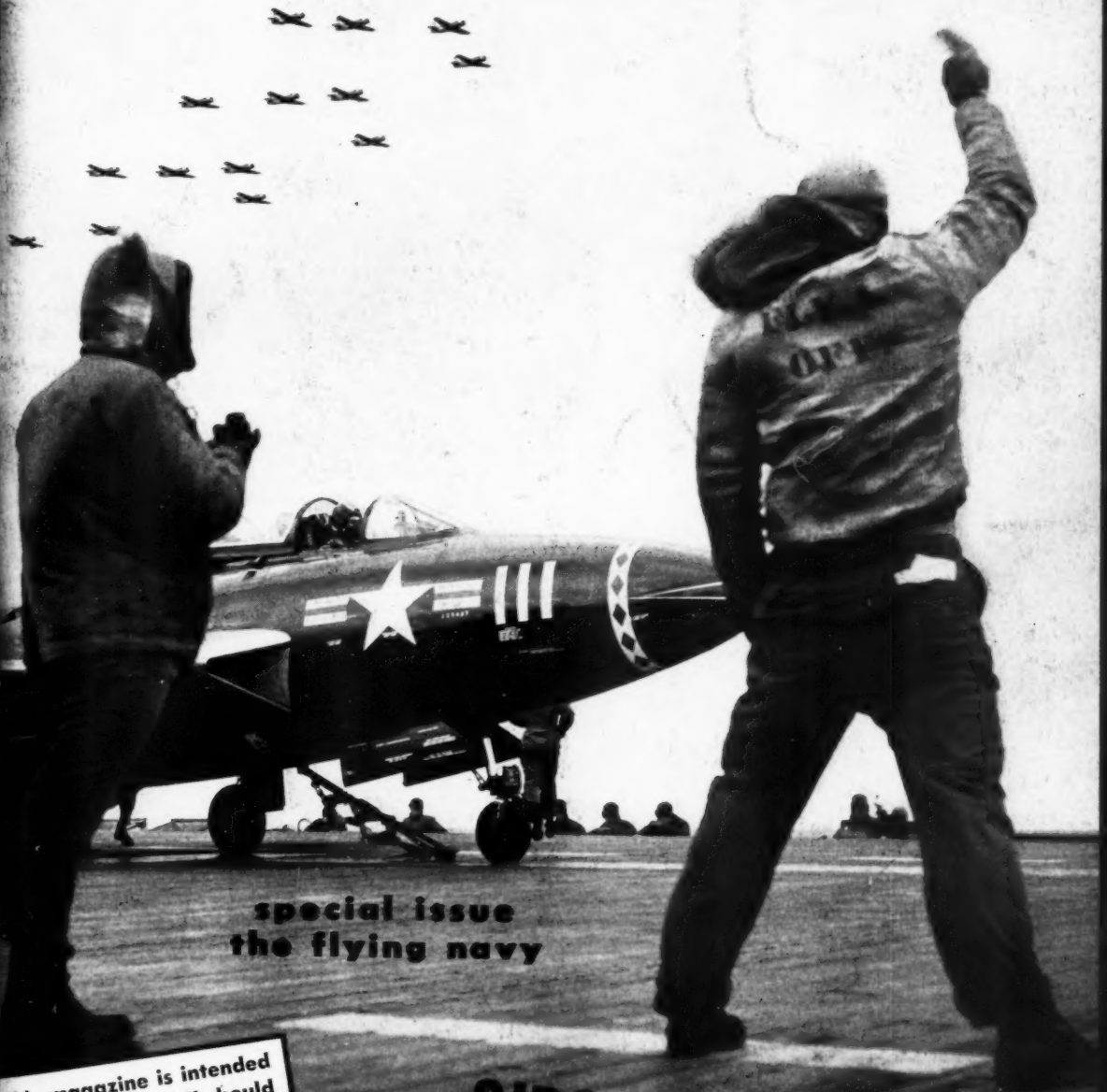


ALL HANDS

THE BUREAU OF NAVAL PERSONNEL INFORMATION BULLETIN



special issue
the flying navy

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for 10 readers. All should
see it as soon as possible.
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MARCH 1956





ALL HANDS

THE BUREAU OF NAVAL PERSONNEL INFORMATION BULLETIN

MARCH 1956

Navpers-O

NUMBER 469

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• AT LEFT: 'QUEEN SIZED' CARRIER, USS *Forrestal* (CVA 59) ties up at Norfolk pier where she takes space of four Navy capital ships. Surrounding her are USS *Taconic* (AGC 17), USS *Pocono* (AGC 16), USS *Valley Forge* (CVS 45), Essex class carrier of WWII, and USS *Macon* (CA 132).

• FRONT COVER: F96 COUGER JET gets the signal to rev-up for a catapult launching from the deck of USS *Oriskany* (CVA 34) while a flight of propeller-driven AD-4 Skyraiders passes over.

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NEW HORIZONS ARE AHEAD for the Navy in the atomic age. Unusual view was taken with new wide-angle lens.

What's New on the Sea-Air Horizon?

JUST A LITTLE MORE than 10 years ago World War II ended. At that time the men, planes, carriers and weapons of the naval air force had undergone the toughest of tests—combat. They were battle-tested, and the victors. Yet within a decade the components which helped make that victory possible had undergone drastic changes and conversions. The pace has been a fast one.

Jet power, supersonic speeds, electronics, atomic warheads and fuels have all combined to change the appearance of the Navy—and there are developments yet to come.

Since World War II the Navy has made rapid strides with her forces underseas and on the surface, but it is in the field of aviation that some of the greatest and most significant changes have been wrought. Such familiar planes as the stubby F6F and the torpedo-carrying TBF have practically disappeared, to be replaced by radically different jet aircraft. Many of the carriers in action today were part of the returning Fleet during 1945-46, but they have been constantly changing until today a wartime Navyman would have a hard time recognizing them. New equipment and new designs have made them totally different ships.

With the scientists and designers turning out new planes, weapons and other improvements at a mile-a-minute clip, it has also been necessary to reorganize jobs, change train-

ing manuals and techniques, and make additions to the rating structure.

The changes have been felt in every section of the sea-air Navy.

If the finger can be pointed at any one reason for the complete overhaul of our flying forces it would probably be pointed at jet power. Because of man's ability to harness jet power (which really isn't new), a whole new horizon has been opened. However, in opening these new vistas it has presented the designers and planners with many problems that had never been encountered before.

The planes have changed in style, speed and concept. Building a plane that can fly at, or near, supersonic speeds means that the designers must learn much more about the characteristics of the air through which the plane must push.

This has caused the radical new designs that now are featured in Navy planes, designs that make the planes of World War II seem as out of date as the first biplane of the '20s.

New weapons that have been developed call for heavier aircraft—carrier planes are capable of carrying the atomic bomb—and jet power has made it possible to mount those weapons on almost every type of plane the Navy has. But the cycle of heavier weapons, more power and bigger planes presented a special problem to the Navy, which requires that planes must land and take off

within as short a distance as possible on carriers.

As a result, the new carriers dwarf the older style. Predictions are that they'll get bigger instead of smaller. Perhaps *uss Forrestal* (CVA 59) and her sister ships best illustrate the newness of the Navy's flying forces.

Forrestal is huge. She has an overall length of 1039 feet, an extreme beam of 252 feet 4 inches and displaces over 59 thousand tons. Into *Forrestal* has gone all the know-how of thousands of men and the forward thinking of the entire Navy until she can handle any carrier aircraft in production today and any on the drawing board.

Her angled deck, a type which has also been installed on several other carriers, enables her to launch and retrieve planes faster and more safely than was thought possible a few years ago. Her steam catapults (which had proved themselves in earlier installations on other carriers) allow her to launch huge planes into the air regardless of whether the ship is headed down wind or not and in some instances they can launch a plane while the ship is standing dead still. This, of course, has been done before with the hydraulic catapult, but the improved steam catapult has greater safety features.

Arresting gear installed on *Forrestal* is vastly improved over that on older carriers and will sustain a weight drag capacity three times that

of previous arresting gear, another tremendous safety factor.

Take-offs and landings have been made safer by other mechanical means such as the Carrier Control Approach which controls planes returning to the carrier in low visibility. It works along the same lines as Ground Controlled Approach but has been perfected to a high degree aboard the carriers of today.

All the changes on *Forrestal*, and probably many others, beside, will be incorporated in *uss Saratoga* (CVA 60), which has just recently been christened; *Ranger* (CVA 61); *Independence* (CVA 62) and a fifth carrier still unnamed, all of which are under construction.

Many of the innovations being built into the new carriers are either already installed on the *Essex* and *Midway* type carriers or are planned for the near future. *uss Antietam* (CVS 36) was the first of our carriers to have an angled deck installed several years back. The first installation was a temporary effort to test the theory. It has worked out so well that it is now becoming a standard look on carriers.

The big mystery about the angled deck is, as, one officer put it, "why someone didn't think of it sooner." This is a brief (and oversimplified) explanation: the angled deck—a British contribution—calls for a relatively small addition on the port side of the carrier and re-making the flight deck to allow planes to land on an angle. It also requires the relocation of the elevators and primary flight and rearrangement of the arresting gear. The conversion brings big savings through reduced flight deck accidents.

As a result of coming in at a slight angle the pilot can keep full power on his plane since, if he misses the wires, there is no danger of plowing into a number of parked planes or men and equipment. Instead, he merely hits the power, takes off again and orbits back into the pattern.

Another development which promises to make landings safer on carriers is the replacement of the landing signal officer with a four-by-six-foot mirror. The increased speeds of our modern jet fighters and the high landing speeds have made it more and more difficult for the LSOs to function quickly enough, but the mirror takes care of all instructions to the pilot without lag.



FAST JET PLANES like these F9F Panthers are among replacements for prop-driven fighters of World War II fame as protectors of the skies above the Fleet.

The mirror is placed about halfway up the deck of the carrier. Four beams of light are focused into the face of the mirror. This cluster of lights form a spot in the mirror which is reflected to the pilot in his approaching plane and at a single glance it gives the pilot an idea of where he is.

If the plane is right in the groove for a landing the spot is centered between a row of stationary colored lights, placed horizontally on both sides of the mirror. If the spot moves down, the plane is low. If the spot

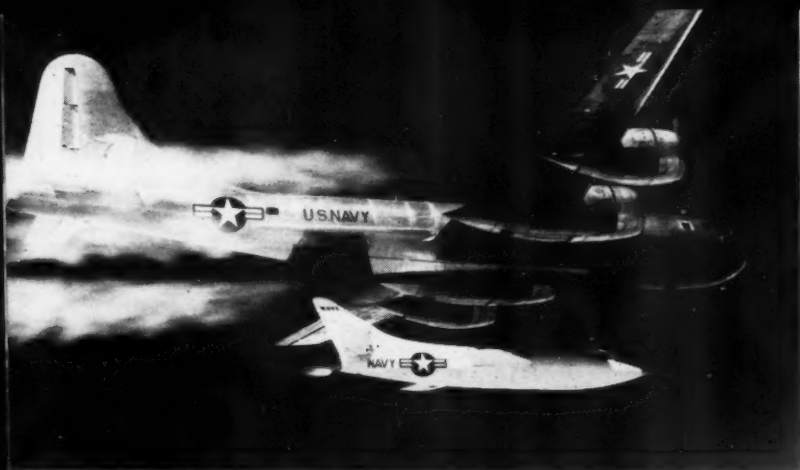
moves up, plane is high, etc. The center of the mirror is bull's-eye.

In conjunction with the mirror landing device the pilot has a special airspeed indicator, known as TRODI, in the plane which is mounted on the left side of the cockpit window. The device is color-coded for the landing speed and shows red if the plane is fast, green if the plane is slow and yellow if the speed is right.

The combination of mirror and speed indicator leaves the pilot free to put all his effort into hitting the

USS SHANGRI LA (CVA 38), one of the many carriers to get the new look, shows off her angled deck and closed-in bow while cruising off California.





TWO FOR THE MONEY—Mother plane drops experimental Skyrocket in air launching. This small plane was first Navy plane to fly faster than sound.

deck at the right moment, and marks the passing of what has been one of the most important men on board any carrier, the LSO.

The most revolutionary advance in the flying Navy, and the one which has caught the fancy of not only Navymen but the entire world is the birth of the vertical rising planes. These strange looking aircraft have changed some of the thinking of aviation experts, as they need no runways nor special facilities other than a small clear area. They rise like a helicopter, then level off once they have reached a safe altitude, and fly in the conventional manner.

Naturally, the new principles and techniques involved will require

plenty of evaluation and tests before the new planes can be adapted to operational use, but the Navy has them under consideration and tests are underway to determine if they can really produce in a manner to change the whole principle of aviation.

At present the Navy is experimenting with two of these vertical risers, the XFV-1 and XFY-1. In appearance the XFV-1 resembles the four-fin torpedo with short, straight wings. It has an unusual tail composed of four fins located equidistant from each other in the pattern of an "X." The XFY-1 has a rather stubby fuselage and features the delta wing.

Helicopters, which really didn't

come into their own in the armed forces until the Korean conflict, loom large in any plans for the future and today are numbered among the workhorses of the Navy. In recognition of their importance, a number of carriers have recently been redesignated. Henceforth many carriers' primary duty will involve the whirlybirds. The new designations are CVHE (escort helicopter aircraft carrier), CVHA (assault helicopter aircraft carriers). In addition to working off carriers, the versatile little choppers have flown from LSTs and the two proved such a successful combination during the Korean period that many LSTs are now carrying copters. They spotted mines, did reconnaissance duty, carried wounded personnel from the mainland and rescued downed airmen when their planes developed trouble.

For any amphibious operation the helicopters are a must. They ferry troops ashore, serve as liaison for the commanding officer of an operation and, in some cases, have been adapted to carry television cameras which send a picture of the entire operation back to the flagship.

The Navy is going all out in helicopter design and research and is testing a jet helicopter whose power is furnished by two 11-pound ramjets mounted on the tips of two of the rotor's 23-foot blades. Known as the HOE-1, this small copter can lift twice its own weight.

There are also two types of "rotor-

ROOM TO SPARE—crewman dashes across wide deck of USS Forrester (CVA 59) to secure an incoming FJ-3 Fury.



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NAVY WHIRLYBIRDS came into their own during Korean conflict. Here one brings in a rescued pilot.

cycles," portable one-man helicopters, which are being tested for possible use in observation, liaison, escape and small unit tactical maneuvers.

Another new gadget, which at present is neither fish nor fowl, has caused many a Navy flier to scratch his head and wonder just what the designers will think of next. This is the small "flying platform" which actually flies on a stream of air, minus any of the aspects generally associated with an airplane or heavier-than-air craft.

Wingless, the small circular device on which the pilot stands, uses the new principle of lift and propulsion called the ducted fan. Two propellers rotating in opposite directions suck air through holes in the platform and supply a downward thrust which supplies the lift. Enclosed in a circular casing which protects the pilot from the blades, the propellers are powered by separate engines developing less than 100 horsepower.

There are many uses to which the "platform" can be put, if they pass the Navy tests. The smaller ones, for instance, might eliminate highlines between ships when transferring passengers and equipment. They have been suggested as observation platforms for an officer directing shore fire or even, in larger sizes, as carriers for small groups of men landing on enemy-held beaches. How and what they actually will do and what spot they will occupy in the Navy of the future depend on the tests now being run on the unique vehicle by the Office of Naval Research.

There is also another new type aircraft being tested by ONR which is even stranger looking than

the "platform." It is the "barrel" plane or ring-wing aircraft. It is a vertical rising aircraft consisting of a circular or barrel shaped wing which is open at both ends. The body of the aircraft is supported inside the barrel wing and is smaller in outside diameter than is the inside diameter of the barrel wing.

The ring-wing can be powered by conventional piston engine, a gas turbine or it can be jet propelled. It has the advantages of the helicopter and the airplane in that it can take off and land vertically and then level off and fly at fast speeds. This is one new development which is in the idea stage at present but which may well become part of the Navy of the future.

While the planes of the future provide a real challenge to the imagination it is the planes of today that the Navy is counting on to help retaliate against any aggressive action from any source. These stand unchallenged as some of the best and fastest fighters and carrier bombers in the world.

Some of the top planes now providing the Navy with a big punch are:

- F9F-8 *Cougar*—Operating at a speed listed as in excess of 600 mph and a range of more than 900 miles the *Cougar* has a ceiling of 40,000 feet and is one of the mainstays of carrier aircraft.

- FJ *Fury*—It has a speed over 600 mph and a range of 900 miles. It can operate up to 42,000 feet.

- F7U-3 *Cutlass*—In the 650 mph class with a ceiling of over 43,000 feet, this is tailless, has two engines and serves as the Navy's day fighter.

- F4D *Skyray*—Most of the statistics on this plane are still classified but it is an interceptor fighter with

a delta wing and is the first shipboard fighter to win a world speed record.

In addition the Navy has several planes which are expected to join the Fleet some time soon. These are the F3H-2N *Demon*, a general purpose plane; the F8U *Crusader*, which is well above the speed of sound class; the F11F *Tiger* which will carry guided missiles, and the S2F-2 *Sentinel*, designed for anti-submarine work.

Bombers are also coming in for increased attention by the Navy,

MODERN INTERIORS TOO—Escalators have been installed from ready room to deck in many overhauled flat-tops and new carriers to join Fleet.





AJ-2 SAVAGE IS LAUNCHED while F2H-3 *Banshee* is readied on USS *Midway* (CVA 41). Below. Pilot learns how to use life saving ejection seat.



thanks to jet power which allows heavier and more powerful planes to use carriers as landing fields anywhere on the 71 per cent of the earth covered by water.

Some of the new bombers, either in production or still in the experimental stage are:

- **AD Skyraider**—One of the few piston-engine type planes still in use, the AD serves as a jack of all trades and is big enough to carry an atomic bomb. It operates at a speed of 365 mph and has a range over 1000 miles.

- **AJ Savage**—This is part jet and part conventional power with two piston engines and one jet. The AJ flies at a speed of 425 mph and has a range over 3000 miles, flying at a ceiling of 40,000 feet. The AJ was the first carrier-based bomber capable of carrying the atomic bomb.

- **P2V Neptune**—Strictly a land-based plane, although some versions have been launched from carriers, the *Neptune* is an anti-submarine and general purpose patrol plane. Latest models of the plane have two

jet engines in addition to the standard two piston engines. Speed varies according to version and it has a range of well over 4000 miles.

- **A3D Skywarrior**—Just joining the Fleet, the A3D will mark a new era in carrier planes as the heaviest and most powerful attack bomber that the world has ever seen. It is a swept-wing bomber with two turbo-jet engines and a 2300-mile range. It is equipped to carry the heaviest munitions utilized by the Navy and will give the Navy a plane that can carry the A-bomb to any spot in the world.

- **A4D Skyhawk**—This plane is the holder of numerous speed records and is rated by Navy fliers as one of the world's fastest planes. The smallest bomber with an atomic punch ever built, it measures less than 27 feet long with a wingspan of 39 feet. Other details of this plane are classified.

- **P6M Seamaster**—The first American jet flying boat occupies a big place in any future planning. Despite an early setback, the Navy is confident that the big flying boat will become a regular addition to Navy planes. It can be used as a mine layer and some conjecture has been made that it will serve as a frame for one of the first nuclear powered planes.

Today's version of the 1945 carrier man lives better, thanks to an increased awareness of things called "creature comforts." Habitability has become more than a luxury these days and has been called by the Chief of Naval Operations, "a military characteristic." Increased comfort pays off as a weary man, bounces back faster if he can relax completely during his leisure hours.

During the 10 years since World War II, the Navy has demonstrated its ability to change and adapt to any conditions. The new ships, weapons and planes, playing a vital part in the over-all defense of our country, are but a preview of the evolution of navies. Tomorrow holds even more changes and more startling revolutions in concept. Whatever they are, you can be sure that the flying forces of the U.S. Navy will be making use of them, in the Navy's primary mission, controlling the seas so that the military power of the nation can be projected into the enemy's territory.

—Bob Ohl, JOC, USN.

ALL HANDS

Nuclear Power for Ships in Today's and Tomorrow's Navy

The super dreadnoughts of yesterday, the super-carriers of today, the "futures" listed in an upcoming naval budget—these are common subjects whenever a group of sailors get around to "chipping their teeth" about the Navy's ships. And there's plenty to talk about.

While inclusion in the budget is no guarantee that they will be built, the following craft are part of the Navy's billion-and-a-half dollar building program proposed in the budget for fiscal 1957 by the Department of Defense:

- A sixth super-carrier, following *Forrestal* (CVA 59) and *USS Saratoga* (CVA 60) in design, but incorporating lessons learned from them.
- A guided missile cruiser, nuclear powered.
- Six nuclear-powered submarines.
- Twelve guided missile destroyers and frigates.
- A nuclear plant for a seventh *Forrestal*-type carrier.

Returning from the world of dreams to that of cold reality, it's interesting to note that *Forrestal*, when she moved from Norfolk to operations off the Virginia capes, required "complete and sole use" of the Elizabeth River, the channel of the river's southern branch and the main channel into Hampton Roads—all on the way from Norfolk Naval Shipyard to the Chesapeake Bay area. Accordingly, the Coast Guard prohibited all ship traffic in the designated areas until the super-carrier had made good

her passage into the vast Atlantic.

Elsewhere in the flattop world:

- *USS Franklin D. Roosevelt* (CVA 42), now being modernized at the Puget Sound Naval Shipyard, has been scheduled for reassignment to the Atlantic Fleet.
- Angled-deck overhauls have been scheduled for *USS Lake Champlain* (CVA 39) and *USS Intrepid* (CVA 11) at New York Naval Shipyard, while *USS Leyte* (CVS 32) is getting a regular overhaul. *Leyte's* touch-up began in February, while *USS Champ* is scheduled to enter the yard in mid-May. *Intrepid* follows in October.
- *USS Randolph* (CVA 15) is back with the Fleet following her conversion (at Portsmouth, Va.) to angled-deck status.

• *USS Monterey* (CVL 26), a 17,000-ton light carrier, has been placed out of commission for the second time in 10 years. She joined the Fleet in time to down 497 Japanese planes and sink 21 Japanese ships during World War II, then was mothballed in the spring of 1946. Recommissioned in September 1950, she has been serving Aviation Cadets as a trainer for the Naval Air Training Command at Pensacola, Florida.

Skate and *Swordfish* have been announced as the names for SSN 578 and SSN 579, two members of the Navy's nuclear-powered undersea fleet now being built. *Swordfish* is the first nuclear submarine to be built in a Navy shipyard and will be some 40 feet shorter and 300

tons lighter than *USS Nautilus* (SSN 571). *Swordfish* takes her name from the SS 139, launched in April 1939 and lost in January 1945, while on her 13th war patrol. *Skate's* predecessor was SS 305, launched in April 1943. Both of the new craft will be the second to bear their names.

And speaking of names, three anti-submarines—the "hunter-killers"—have been given new monikers: *USS K-1* is now *Barracuda*, *K-2* is *Bass* and *K-3* is *Bonita*.

Also in the field of what's new, *USS Albacore* (AGSS 569) has proved to be so successful that her radical hull design will be used for the upcoming SS 580, SS 581, SS 582 and the nuclear-powered SSN 585.

Albacore is shorter and fatter than conventional submarines, with a small bridge, blimp-like tail and a single five-bladed screw. This design has been found to add greater range, greater underwater speed and improved maneuverability.

Four ocean radar station ships, floating segments of the continental air defense system, have received their commission pennants. They are *USS Scanner* (YAGR 5), *Locator* (YAGR 6), *Picket* (YAGR 7) and *Interceptor* (YAGR 8). Eventually these four, all converted from commercial hulls at East Coast yards, will operate off the Pacific Coast, using San Francisco as a home port and yard. Four similar ships are already in operation off the East Coast of the U. S.

ANOTHER SUPER CARRIER hits the sea. It took twelve tugs to tow *USS Saratoga* (CVA 60) to berth after launching.



The Group Nine Navy

"ALAMEDA TOWER, this is Navy 1234 at two thousand over the Golden Gate Bridge. Request landing instructions. Over."

"Navy 1234, this is Alameda Tower. Cleared into traffic pattern, runway three six, wind north one six. Check base wheels down and locked. Over."

"Alameda Tower, this is Navy 1234, cleared into traffic pattern, runway three six, wind north one six. Out."

"Alameda Tower, this is Navy 1234. Turning base wheels down and locked."

"Roger Navy 1234, cleared to land."

group of men who are members of the team that actually keeps the Navy's air force ready and in the air. The success of a Navy air group or squadron does not hinge on the pilots and aircrewmembers alone. A large and very important segment on the flying team is the men in these 15 ratings, both flying and non-flying personnel, ground crews and deck crews, and training and supply specialists.

Since the airplane is one of the Navy's greatest offensive and defensive weapons, it's only natural that the men who fly, repair and maintain these weapons have to be the best

ters for the Navy's enlisted airmen are located at three NATT Centers: Memphis, Tenn.; Norman, Okla.; and Jacksonville, Fla. Headquarters for this vast "Air University" is at Chief of Naval Air Technical Training Memphis, Tenn. Let's take a quick glance at the different aviation ratings: what they do, what they must know. A good example would be our aircraft that just landed at NAS Alameda.

Landing on AC Current

As the pilot approached the air station, he radioed for permission to enter the traffic pattern and land. The man in the tower who relayed



PLANE PUSHER on flattop's deck is lying down on the job. He'll pull wheel checks while shielding face from flying dust.

The plane touches down on the runway and the pilot listens to the air controlman in the tower give taxi instructions. Once at his destination, a ground crewman directs him to a parking spot and the plane-handling crew begins tying down the aircraft.

The above conversation, or a variation of it, takes place many times a day or night, throughout the Navy at air stations and on aircraft carriers. Every time a plane lands or takes off from a carrier or air station, the Air Controlman is on the job, assisting the pilot by relaying vital information and clearances of his right of way.

Group Nine Navy

The Air Controlman rating is one of the 15 ratings in the Aviation (Group IX) Ratings. He is one of a

in the world. The capabilities and teamwork of this group of men were well proven during World War II in the Pacific when Navy pilots and gunners chalked up a shoot-down score of 14-1 over enemy Japanese pilots.

Versatility is the word describing both the Group Nine Navy and the equipment it uses. The explanation is simple: the flying Navy has to be triphibious in its thinking and in its operations. It must have aircraft that are at home not only over but on the water—and on the decks of different types of ships ranging from carriers to LSTs—and also on the land.

It takes a lot of time, money and individual effort on the part of the trainees to learn their jobs thoroughly. The major training cen-

ter the necessary information and clearance was an *Air Controlman* on watch in the tower.

The most critical moments in normal flight are the take-off and landing. It's not enough that the pilot knows how to operate his controls. He must also be assured of clear skyways and landing strips free of other planes. This assurance is given him by the AC, the "air traffic police."

Besides the planes actually landing or taking off, these men and women in the AC ratings must keep a close check on each plane operating in the vicinity of their tower, tell pilots when to take off and land and flash warnings to planes in flight when trouble is imminent.

ACs assist in the control and direc-

tion of air traffic by means of radio, radar, flashing light signals and flag hoists. They provide the pilots with information on air traffic, navigation, and weather conditions. Another of their duties is to operate and make minor adjustments to GCA (ground controlled approach systems), to interpret targets on the radar screen and use standard plotting procedures for locating the position of planes.

To understand better the problems and situations of pilots of Navy aircraft, ACs should also have a working knowledge of such technical subjects as aerology—the science of weather—navigation, communications, tactics, capabilities and characteristics of aircraft, principles of the operation of radar and they must be able to read and make corrections to aeronautical charts and maps.

Another important function of the Air Controlmen is the operating of ground-controlled and carrier-controlled approach equipment. Much of the paperwork involved in dispatching all flights and coordinating control of all flights is done by the ACs.

Besides their own air station's air traffic regulations, the ACs are required to know the regulations of the Civil Aeronautics Authority regarding standard airport traffic control procedures. To round off their training, as these men go up the rating ladder, they must pass the equivalent of the Junior and Senior Federal CAA Tower Control Operator's examination.

Air-Minded Mechs

One of the oldest, if not the grandpappy of them all, is the rating of *Aviation Machinist's Mate*. As is quite evident, the safe and efficient operation of any aircraft depends largely upon the safe and reliable performance of its engines. If a pilot notes anything unusual about engine performance during the flight, the information goes to the AD. The AD is the man responsible for this job, keeping the engine and other mechanical equipment in perfect working order.

Anything from changing the oil to a complete overhaul of an engine is the responsibility of the Navy's ADs. The more routine duties, such as lubricating, refueling, changing tires, warming up engines and cleaning the airplanes, fall to the lower rated men. As the men advance up the rating ladder, many of them are assigned to the larger aircraft as flight

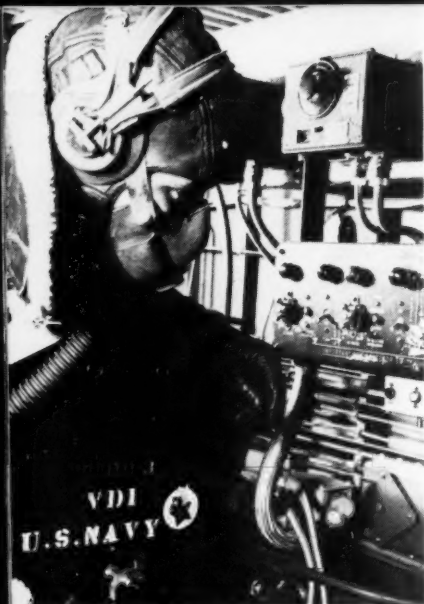
engineers. Their job involves testing and operating engines, controls and other equipment both before and during flight and when taxiing, taking off, climbing, descending and landing.

The theory and operation of aircraft for servicing, maintaining and repairing them are basic skills of all the Navy's ADs. Like men in any other Navy rating, the aviation mech may become especially skilled in one phase of engine servicing, repairing and maintenance, but he still must know all the other parts of the AD rating.

- He must be able to service, maintain, install and repair engines; adjust valve clearance, time magnetos and make compression checks; name and operate common hand tools, power-driven tools and various measuring instruments.
- He must know aircraft handling on the ground, in the water and in ships; proper method of loading, securing, and storing equipment aboard aircraft; procedures for warming up, testing, and stopping engines. He must qualify and obtain a license to taxi aircraft, using the plane's engines as source of power.
- He must understand hydraulic and electrical principles as applied to propellers, and be able to repair, remove, service and install propellers and their accessories; check the balance, pitch and track of propellers. He must know methods for heat-treating, straightening propellers and testing their strength.
- He must be able to service,

MANY SAILORS with varied aviation skills put and keep planes above the Fleet. Above: Gas gang fills 'em up. Below: Airman tows jet for spotting.





NAVY PHOTOG in high altitude gear checks camera's automatic shutter recording results of bombing mission.



JET ENGINE is worked over by Aviation Machinist's Mates on USS Boxer (CVA 21). Below: Aviation Electronics Technician installs radio receiver.



maintain, install and repair carburetors and fuel systems; trace fuel lines, clean strainers and check valves and fuel cells for leaks or sediment; test flow, and operation of carburetors and water injection systems.

Most of today's Aviation Machinist's Mates received their basic AD training at the Class "A" School which covers the fundamentals of aircraft engines, basic principles of the theory of flight and of the construction, weight and balance of aircraft, reciprocating powerplants and line operations, reciprocating powerplant accessories, engine maintenance and jet powerplants and maintenance.

A large portion of their training has been "on the job," supervised by the senior rated ADs. In addition, there is an AD "B" school available to highly qualified senior petty officers in the AD rating.

Tin Benders

The men in the rating of *Aviation Structural Mechanics* have the job of maintenance and repair of aircraft wings, fuselage, tail, control surfaces, landing gear and attending mechanisms. AMs fabricate sheet metal and install, maintain and repair tubing systems and flexible hose.

The repair and maintenance of rubber equipment, such as self-sealing fuel cells and tires and tubes, the repair of fabric-covered surfaces of aircraft and the use of spray-painting equipment are all a part of their work. AMs also maintain ejection seat equipment, and mechanical parts of aircraft cabin pressurization and air-conditioning systems.

Aviation Structural Mechanics must be top notch welders. They must be woodworkers also, making wooden forms, blocks, jigs and templates for the manufacturing and repairing of

aircraft structural parts. Hydraulic systems which operate the aircraft landing gear, flaps, bomb bays, automatic pilots and brakes are also the worry of the AMs.

The "tin benders" (as the AMs used to be nicknamed when their rating was known as Aviation Metal-smith) must be able to fabricate and repair aircraft sheet metal parts, metal fittings and tubing by cutting, flaring, bending, threading and assembling.

Most AMs receive their basic instruction at the 14-week course of training at the Aviation Structural Mechanics Class "A" School which covers such subjects as welding, aircraft sheet metal, fabrics, plastics, rubberized equipment repair, aircraft finishes, aircraft hydraulics, aircraft structures and repairs and inspections.

The senior petty officers in the AM rating are eligible to become aircrewmembers on the larger aircraft. Advanced Class "B" schooling is also available to these men.

Sparky and Twidget

One of the most highly technical ratings in the Navy today is that of *Aviation Electronics Technician*, who carries the moniker of "twidget" (apparently on account of their gadget-twisting occupation). Because of the dependence by our modern Navy on radio, radar and other electronic devices for rapid communications, efficient navigation, controlled landing approaches, detection of and guidance to enemy or other objectives, electronics equipment must be kept in perfect operating condition.

Close relation of the AT is the *Aviation Electronicsman*, better known as "Sparky" for understandable reasons. The AL ratings will be merged with the AT ratings in 1958.

Following is a rundown of the AT's responsibilities. In his daily work, the Aviation Electronics Technician uses such instruments as voltmeters, ammeters, and ohmmeters. He operates the various items of electronic equipment in order to evaluate performance. This includes energizing and securing the equipment, setting operating controls, making operator's adjustments, and reading and interpreting dials, built-in meters and cathode ray tube presentations—images on a radar or other screen.

Besides the day-to-day maintenance of the electronic equipment, which includes cleaning and lubri-

ALL HANDS

cating, the ATs make circuit repairs indicated in their test analyses. This could include anything from replacing a tube or wire to putting in a completely new assembly.

The Class "A" School for Aviation Electronics Technicians is approximately eight months long and includes training in electronic fundamentals, transmitter fundamentals, International Morse Code, communications systems, radar electronics fundamentals, operational maintenance and the flight phase, which includes actual aerial flights.

AQs Deliver PDQ

Another highly technical aviation rating (and closely allied to the AT rating) is that of *Aviation Fire Control Technician*. Techs in this rating (they also go by the name "Tex") are charged with the maintenance and repair of the highly complex equipment that fires the guns on Navy's combat planes.

AQs inspect, clean, lubricate and make operational tests and adjustments of sights, bomb directors, armament control and turret control systems. They also work on computers, gyros, optical components and fire control radars. AQs, like the ATs, must be able both to read and to draw schematics of their various electronic equipment.

The men in this relatively new rating must be able to analyze electrical and electronic test data and use this information as it applies to aviation fire control equipment. They must also be able to set or determine values to be used for measuring purposes.

The basic school for apprentice Aviation Fire Control Technicians is an eight-month course. Subjects covered in this Class "A" School include fundamentals of AC and DC electricity, basic electronics, optics and hydraulics as applied to aircraft armament control and bombing systems, aviation fire control and bombing problems and their solution by electronic and electromechanical means. To all this add the following and you get the basic picture on requirements: fire control and bombing radar fundamentals, and casualty analysis, test, and adjustment, and technical maintenance of aircraft control and bomb director systems.

How to Make Good Punch

Navy airplanes seek out and destroy the enemy. While the ATs and AQs work the equipment that seek



NAVY'S TYPHOON TRACER—Aerographer's Mate tunes in weather tracking radar which can pinpoint storms 200 miles away with less than five miles error.

the enemy, it's the *Aviation Ordnanceman's* job to prepare the plane for its mission of destruction. If a bomb doesn't explode, or a gun fire, it is useless. The Aviation Ordnanceman is one of the specialists responsible for the perfect working order of armament on Navy planes—he makes a good punch.

The AOs are the men who assemble and install fuses in bombs and projectiles, load the bombs, rockets, torpedoes and guided projectiles in the aircraft. They bore sight and align direction sights for shooting, bombing, torpedoing and launching rockets. The Aviation Ordnancemen are also charged with the handling, stowing and issuing of munitions and personal small arms for use in aircraft.

The Aviation Ordnancemen must be able to maintain, repair and overhaul machine guns and cannons, sight and load gun cameras on photographic airplanes. The AO must know the fundamentals and theory of internal and external ballistics, the principles of projection of missiles from aircraft and the forces affecting their direction.

The 14-week course at the Class "A" Aviation Ordnanceman School trains the embryo "Guns" in small arms, aircraft machine guns, 20mm automatic guns, technical publications and ordnance electricity, aircraft munitions, bombs and fuses and the operation of aircraft armament such as range, malfunctions, installation, sight and general servicing.

Missileers with Muscles

Another rating closely allied to AT, AQ and AO is the rating of *Aviation Guided Missileman*. Like the AQ rating, the GF specialty was



PLANE'S WING mechanism is repaired by AM on flight deck. Below: Air Controlmen serve as 'traffic police' at NAS.





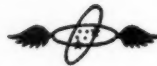
AM
AVIATION MACHINIST'S MATE



AO
AVIATION ORDNANCEMAN



AL
AVIATION ELECTRONICSMAN
To be merged with AT when directed by BuAer



AT
AVIATION ELECTRONICS TECHNICIAN



AE
AVIATION ELECTRICIAN'S MATE

established only in recent years.

After long research and thousands of tests, guided missiles can now be launched from land, sea and air positions. Their flight is controlled by intricate internal mechanisms which are maintained, serviced and overhauled by the Navy's Aviation Guided Missilemen.

When a guided missile arrives at the ship or station from the factory, the GFs must unpack and prepare the missile sections for assembly. Each section of the missile must be checked with test equipment such as the voltmeter, ammeter, ohmmeter, multimeter, megohmmeter, tube and battery tester, signal generator and spectrum analyzer.

Missile systems which the GFs must maintain and keep in top running order include missile guidance, control and telemetering systems, and extending to such tongue twisters as the electrohydraulic, electropneumatic and electromechanical systems.

Another important function of the "missileers" is the supervising and training of lower rated personnel in testing and repairing guided missile sections and components. Also, individual logs and histories of each of the missiles must be kept up to date by the GFs.

Although not yet established, the

Aviation Guided Missileman school will train Navymen in the fundamentals of electronics, radar, hydraulics and pneumatics, missile guidance including gyroscope and accelerometer principles of operation, and air-launched missile assembly, testing, loading, repairing and operational employment.

Putting Electricity Back in the Air

The number of generators, motors and transformers in a single airplane would amaze you. And the maze of connecting wires requires the care of a man nothing short of an expert. The Navy's *Aviation Electrician's Mates* ("Sparks" to their shipmates) have the job of maintaining, adjusting and repairing the various generators, converters, lighting, control and indicating systems found aboard a Navy plane.

Instruments such as the temperature indicator, tachometer, synchronizer indicators, position indicators for landing gear and wing flaps and the service and repair of automatic pilots come under the care of the AEs. If you've ever had any trouble with the ignition system in your automobile, you can readily imagine the troubles that can possibly confront the Aviation Electrician's Mate when he works on a plane's ignition system.

Aircraft compasses, including re-

mote indicating compasses and compass repeaters, are also the responsibility of the Aviation Electrician's Mates. Naturally, AC and DC electricity fundamentals come as second nature to the AE. He must also know the theory and principles of operation and calibration of the different aircraft mechanical, electrical, vacuum and gyro instruments.

In the basic Aviation Electrician's Mate School, which is 22 weeks long, the AE striker is trained in basic electricity, amplidyne systems, electric propellers, motors and engine starters, ignition systems, electrical power supply systems and line maintenance.

The Sunshine Boys

One of the most important single factors affecting air operations is the weather. In addition to using the generally available information on weather forecasts, the Navy must maintain its own weather observing experts, the Aerographer's Mates. The AG is the observer, forecaster and distributor of accurate weather information—and he's particularly important in those areas not covered by the regular weatherman.

No, he doesn't depend on his bunnions to indicate to him when it will rain, or a hedgehog to tell him it's going to snow. Instead, he uses such aerological instruments as the barometer, thermometer, anemometer, clinometer and psychrometer to gather the weather data.

From his information, the AG can prepare weather charts and also compute ballistic wind and density of the upper air for more accurate anti-aircraft and surface firing.

Using both instruments and estimation, the AG can determine the ceiling, visibility, wind velocity, and cloud coverage for use in making local forecasts. As the ship or station's weatherman, he makes both short range (6- to 12-hour) and long range (36-hour) weather forecasts.

Training in the 14-week Aerographer's Mate School includes instruction in meteorological instruments, weather codes, adiabatic charts, practical work in preparing charts, using and maintaining instruments, balloon soundings, upper air soundings, weather and cloud observations and weather map analyses.

CHECKING THE BOOKS is a big time operation for the Aviation Storekeeper who is in charge of the many and varied items needed to keep the Navy flying.



ALL HANDS



AM
AVIATION STRUCTURAL MECHANIC



TD
TRADESMAN



AB
AVIATION BOATSWAIN'S MATE



PR
PARACHUTE RIGGER



AG
AEROGRAPHER'S MATE



AC
AIR CONTROLMAN

Boats in the Clouds

Wherever you travel in the Navy, you're going to have the boatswain's mates—and the flying Navy is no different. The air "deck gang" is guided by the senior petty officers in the *Aviation Boatswain's Mate* rating.

If you've ever seen carrier operations, either on film or for real, you are impressed with the deft handling of aircraft. As soon as one is launched, another is quickly jockeyed into place, ready to be catapulted from the deck. Besides assisting in the launching of aircraft, the aviation "Boats" is charged with the care and maintenance of arresting gear and barriers. They operate the winches, cranes, booms and ship's elevator controls.

ABs assist in the fueling and defueling of aircraft and in the loading of aviation gasoline and lubricating oils aboard ship. And like all good boatswain's mates, they operate small boats to service and moor aircraft, and in rescue and salvage operations.

Aviation Boatswain's Mates can qualify as flight crew members, acting as equipment riggers, supervising the loading and securing of cargo. Also like his surface counterpart, the AB is quite deft with knots and splices, deck equipment and handling lines and cables.

There are two sections to the 16-week Aviation Boatswain's Mate School. In the first section, he is taught aircraft indoctrination, fundamentals of hydraulics, physics, electricity and mechanics, wire-rope splicing, catapults, aviation seamanship and firefighting.

In the second phase of his training, usually received aboard an aircraft carrier, the AB striker learns flight deck operation, catapults, arresting gear and gasoline handling.

Riggers of Life Lines

Parachute Riggers in the Navy have a standing guarantee of their product: If the one you have doesn't work, bring it back and they'll give you a brand new one at no extra charge. Luckily, the PRs have never had to stand by their guarantee. To the Navy's PR falls the highly responsible job of keeping parachutes and other aviation survival equip-

ment in perfect condition.

In addition to being the lifesaving equipment of aircraft crewmen when they have to bail out, parachutes are also used to drop urgently needed medicines, food and supplies to isolated disaster victims.

PRs are charged with the job of maintaining, storing and issuing oxygen and carbon dioxide equipment. Safety belts and shoulder harnesses are the charge of the PRs. Having charge of aviation survival equipment, the PRs equip and pack all types of life rafts, make patches and minor repairs to rubberized fabrics including rubber life jackets and life rafts.

The Class "A" Parachute Rigger School provides 15 weeks' training in parachute packing, sewing machines and fabrics, oxygen and carbon dioxide, survival equipment, and ends up with the acid test: packing your own parachute and using it to make an actual jump.

Keeper of the Winged Keys

With the large-scale development of aviation in the Navy has come the problem of supply. The various types of naval aircraft with their specialized parts, equipment and supplies have brought a demand for men specially trained in aviation supply. The purchase and stock control of aviation stores, with their attending correspondence work, are jobs for the *Aviation Storekeepers*.

As well as being a good stock room clerk, the AK must be a good bookkeeper and part yeoman. AKs store, issue, and control such items as flight clothing, aeronautical materials, spare parts, and ordnance, electronic, structural and engineering equipment.

As a bookkeeper, the AK maintains stock control of aeronautical equipment and estimates future needs of equipment. He inventories not only his stock but also the aircraft in his squadron.

As part of his yeoman duties, the AK (like the SK, he's known as "Stores") records incoming and outgoing correspondence, keeps his files and stock control cards up to date and makes entries in records kept, prepares reports and returns on his aviation supply activities.

At the 12-week long Aviation

Storekeeper School, the AK striker learns to use adding, calculating and duplicating machines and brushes up on his typing. Other subjects taught in the AK school include basic aviation supply, catalogs and publications, aviation supply afloat and ashore, office procedures and practical application of principles and procedures as applied to electronics, airframe spares, aircraft accessories and parts, aircraft fluid systems, engines and parts, engine accessories, propellers and control equipment, and instruments.

Shutterbugs Have You Framed

Everyone likes to look at pictures, and the Navy is no exception. But photography has a big place in the Navy because it is used in everything from medicine to reconnaissance of enemy positions to identification pictures. The official Navy photographs are shot, developed and printed by the Navy's *Photographer's Mates*.

Activities of the Navy and its men, both in war and peace, are visually recorded on film by PHs. Photographer's Mates, using both still and motion picture cameras, make these pictorial records of technical, historical and newsworthy events aboard ships and at shore stations.

Formerly, there were both aerial photographers (AF) and surface photographers (PH), but these have since been combined and all men in the rating given the PH designation. Some PHs have a chance to become aircrewmen, when they perform duties as members of flight crews, using equipment such as the standard oblique aerial reconnaissance cameras and motion picture cameras for aerial flight.

In fighter type aircraft used as aerial reconnaissance planes, the



AK
AVIATION STOREKEEPER



PH
PHOTOGRAPHER'S MATE



AQ
AVIATION FIRE
CONTROL TECHNICIAN



GF
AVIATION GUIDED
MISSILEMAN



PLANES line aircraft carrier's flight deck, which has temporarily been turned into a private beach as Navymen of all ratings relax in the Mediterranean sun.

photographer supplies the film to the Aviation Ordnanceman who loads it into the airplane's gun cameras.

Besides being able to obtain good results with the different types of cameras he uses, the PH must be able to test, adjust and perform preventive maintenance on his equipment.

The 16-week Photographer's Mate School at Pensacola, Fla., teaches budding photographers the funda-

mentals of photography, including chemistry, photographic emulsions, operation of different types of cameras and photographic equipment, fundamentals of motion picture photography and theory and practical work in elementary aviation photography.

Traders Sell Safety and Training

A very important phase of aviation is training. It has been proved that simulated training, besides being low

cost, is much safer for both the instructor and the trainee. The Navy has adopted many simulated trainers known as Special Devices. The specialists who operate and maintain these devices are the *Tradevmen* (the Tradev part is short for Training Devices).

These various types of training aids are used to simulate actual operating conditions. Trainers have been developed that simulate the actual operation of the different types of aircraft from trainer to high speed jet now in use by the Navy.

These simulated trainers are not confined strictly to the aviation phase of the Navy. Many of these type trainers, such as the Submarine Attack Teacher, and the Support Arms Evaluator (See "These Fakes Save Lives, Time, Money" June 1955 *ALL HANDS* p. 2) are used by the submarine and destroyer Navy.

But the biggest field of work for the TD (he's also known as "Trader") is in the aviation trainers. One of the newest simulated trainer is the LAT—Landing Approach Trainer. This trainer is designed to give the student aviator who has had no previous flying experience a clear understanding of how a landing approach looks to the man in the cockpit.

"Flying" a trainer is done in much the same manner as in a Link Trainer. A movable crab controls the projected runway image to give the illusion of the aircraft's turning from its base leg to the final approach to the field for a landing.

The crab controls the projected light beam during the trainer's turns and adjusts it to the relative height of the trainer as well. Thus as the trainer descends, the runway image flattens out, giving the same type of view that a pilot sees in making a landing approach in a real plane.

Not all of the trainers, of course, are intended for the student aviator. Many are used as preliminary indoctrination for pilots being checked out in a different type of aircraft with which they are not familiar. Also, many pilots who are desk-bound, or in a crowded locality and don't have many opportunities to maintain their instrument flying skills, take advantage of the Link Trainers.

Any man who has put in time on these trainers will vouch for their simulated reality. In fact, a "Link Legend" from Washington, D. C., has it that a pilot inadvertently allowed his trainer to get into a spin.



The Tradevman instructor told him to recover, he was nearing the ground, but the unfortunate man was thoroughly confused.

Finally, in exasperation, the instructor shouted: "You're going to crash!" Hypnotized by the reality of the simulated flight, the student yanked back the hood, bailed over the side of the trainer, and broke a leg on the floor four feet below.

Along with actual operation of the trainers, Tradevmen are also qualified to maintain, install and repair training aids and devices. The TDs train both officers and enlisted men in such fields as gunnery, aviation, navigation, seamanship, communications, engineering, tactics of ships and aircraft, recognition of ships and aircraft, and electronics.

It All Comes From the Air Pool

The men in these 15 aviation ratings, together with the pilots that fly the planes, combine to make the flying Navy the topnotch organization that it is. But we still have one source to consider: the men in the rate of AIRMAN.

The Airman is the large part of the "muscle" in the aviation ratings. Pushing airplanes around the flight deck or on the line, washing and polishing airplanes, and messcooking, are hazards ever present to the men in the Airman rate.

Unless he earns his AN rate in the Fleet, the man usually attends Airman School before going on to some technical school such as AD, AT, AO, or any of the other aviation schools.

Since the men attending the AN "P" School are, for the most part, just out of high school, their knowledge in mathematics is put to good use in learning the elementary principles of weight and balance as these factors affect the control, range, and stowage of equipment aboard aircraft. This mathematical know-how is also helpful when the students scratch the surface of the basic theory of flight.

The Airman School serves as a sort of "kindergarten" for the Navy's embryo airmen. It prepares him for both his upcoming technical schooling and for duties later on as an Airman in the Fleet.

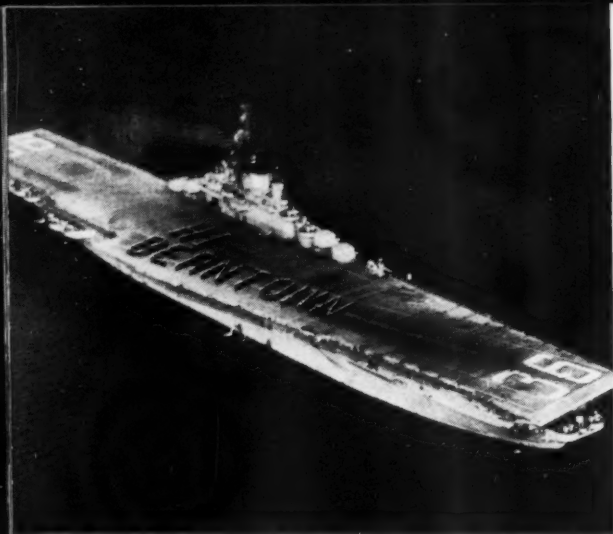
Whichever rating he is striking for in the Group Nine Navy, the Airman knows he's headed for a job with a big future.

—Rudy C. Garcia, JOC, USN.

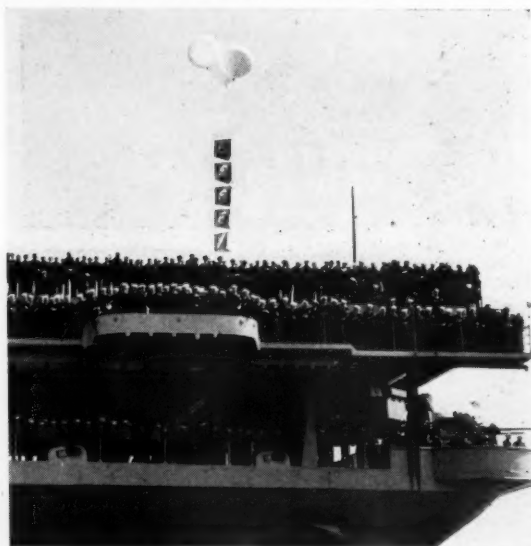


MAN BEHIND THE FIRE POWER of naval air force is the Aviation Ordnanceman loading 20mm ammo in an F9F. Below: Parachute Riggers fold 'silk' at sea.

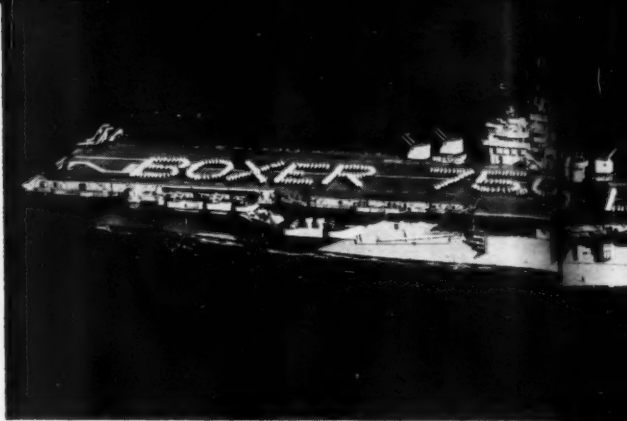




IN THE FOG of Boston's harbor the crew members of USS Antietam (CVS 36) spell out a friendly greeting to city.



USS ESSEX (CVA 9) tries different method of greeting. Below: USS BATAAN (CVL 29) heads home for mothballs.



USS BOXER (CVS 21) announces landing record with crew.

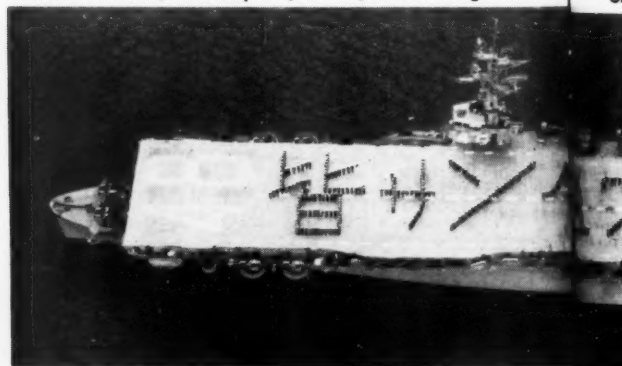
Carrier Crewmembers

SIGNAL SEARCHLIGHT, flag hoist, and semaphore are the standard methods of visual communications in the Navy, but carrier men have an extra trick up their sleeve which they put into play for special occasions.

Taking advantage of the large area of their ship's flight deck and the large number of crew members for the operation of a flattop and her planes, they muster topside and line up in a military fashion to spell out their messages in person.

Messages vary with the occasion and the patterns resulting may be complex or simple but in either case they are always pleasing to the eye when seen or photographed from above. Occasions inspiring Navymen to communicate in this non-standard manner have been many. One of the most common occasions for this type

GOING NATIVE, USS Saipan (CVL 48) salutes Nagasaki.



HELPING HANDS of carrier join in the fight against polio.





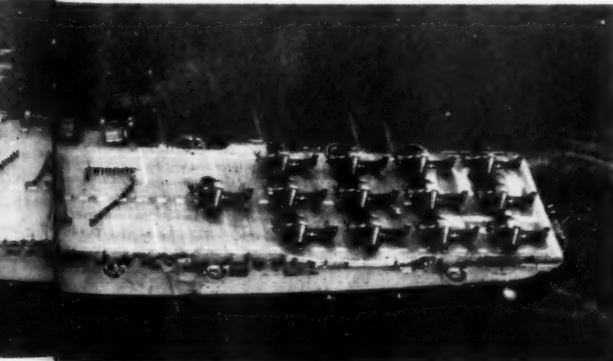
LANDING was a milestone in her ten-year-plus sea duty.

Send a Message

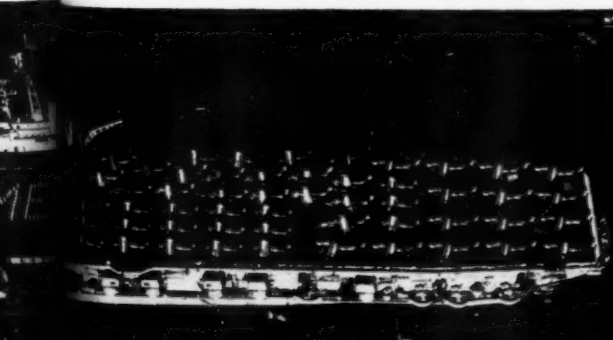
of topside muster is the receipt of orders that turn their ship's bow toward home. On entering a port, carrier men have often expressed their feeling of good will toward the inhabitants by spelling out a greeting. Also these civic minded bluejackets have lent their talents and flight deck in support of various charity drives such as the one for cancer and the "March of Dimes." They have spread good will for the Fleet by lining up on behalf of many local and national celebrations such as the Mardi Gras, and they have spelled out greetings to liberty ports.

Navy photographers flying over head have made pictorial records of these events and most of them sooner or later find their way to ALL HANDS. Shown here is a representative sample of these photos from nine different carriers of various parts of the Fleet.

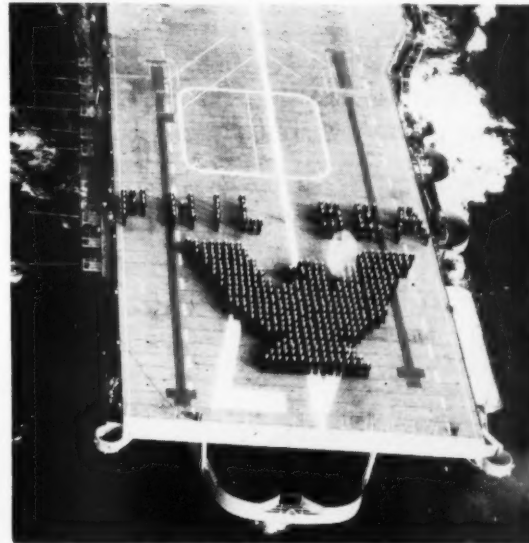
SAILOR'S MESSAGE in Japanese spells 'Hello everyone.'



FITTINGLY, ship is USS Franklin D. Roosevelt (CVA 42).



JOINING IN the celebration of the Mardi Gras, USS Monterey (CVL 26), now in Reserve, spelled out the event.



DECK DESIGN of USS Philippine Sea (CVS 47) is made of new promotions. Below: USS Tarawa (CVS 40) greets Jax.





EAGER-TO-BE-AIRBORNE NAVCADS wait in front of SNJ trainers. Below: Advanced training is done in F9F Panthers.



Future Pilotsh

A NAVY JET STREAKED out of the sun and zoomed overhead, passing out of sight into the blue Florida sky almost before it could be identified by four young men standing at the entrance to the U.S. Naval Air Station, Pensacola, Fla. As they watched the vapor trail disappear one thought passed through four minds—"Some day that will be me."

The four men had come to Pensacola to learn to fly. They were going to train at the oldest and largest naval air station in the country—the "Annapolis of the Air" where 3000 Navy pilots are trained annually.

One of the spectators was Ensign John Sensi, usn, who had arrived at Pensacola directly from the U.S. Naval Academy to train to be a pilot. Planes were not new to Sensi. During his first summer at the Academy he had been a passenger on two Navy flights—once in a primary trainer and once in a patrol type plane. Although each flight had been preceded by ground instruction, the flights were designed more to familiarize him with Navy aircraft than to train him as a pilot. Looking back,

though, he wondered if it hadn't been one of these flights that had decided him on a career in the naval air force.

His family would probably say it went back to his kite-flying days. Whenever it was, he knew before he left the Academy that he wanted to be a Navy pilot.

As a Second Classman he'd devoted his whole summer to aviation. He went on a carrier cruise, a continental air cruise all over the U.S. and even had some aviation training at the Academy. This was helpful but it did not lead to actual pilot qualification or to the solo experience he wanted.

In his first class year he continued his studies in aviation and his close association and frequent contact with aviation personnel, equipment and aircraft convinced him that the sky was his operating medium. All he needed now was to learn to fly. He was on leave to visit Pensacola and look things over before his pre-flight training began and although he wouldn't start training for eight more

two years of college, was in good physical condition and was 22 years of age. He was entering pre-flight training under Recruiting Service Inst. 402.1 just like a civilian with two years of college but with the advantage that he was already familiar with naval life.

Prout would be discharged and immediately be enlisted as a NavCad, USNR. However, he would eventually have an opportunity to go Regular if he wanted to.

Recognizing the success of the Reserve program and the essential roles that former NavCads are playing in the naval air force, the Navy Department has arranged to take a number of Reserve aviators into the Regular Navy each year. During his two and a half years of active duty in the Fleet, Prout may apply for transfer to the Regular Navy. If selected he resigns his Reserve commission and accepts a Regular commission.

If he decides to return to civilian life, he is obligated to continue in the Naval Reserve for a total of six years'

Do They Add Wings to Ships

weeks he was anxiously looking forward to it.

The man standing next to Sensi was Naval Aviation Cadet William Draper of Cutler, Indiana. Like many of his shipmates Draper was entering pre-flight school under BuPers Inst. 1120.20A which authorizes enlisted men to apply for pilot training. A former AD3, Draper was discharged at Pensacola and immediately enlisted as a NavCad USNR. He was on his way to a commission in the U.S. Naval Reserve and a pair of gold wings. He wasn't too keen on the classroom work that stood between him and his wings but he knew that eventually it would help to make him a better pilot. And when the task seemed too great there was the roar of planes overhead, a constant reminder that he was moving closer to his goal of being a Navy pilot.

The third man was George Prout, AE2, USNR, who had been on active duty during the Korean War and then returned to civilian life to become a "week-end warrior" with a squadron at the Naval Air Station, Glenview, Ill. He had the necessary

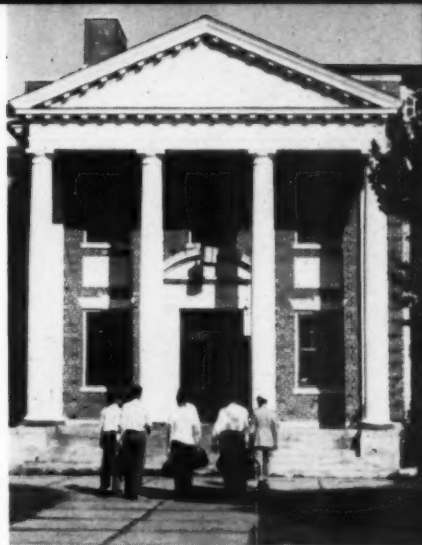
commissioned service. If he lives near one of the 27 Naval Reserve Air Stations, he may join a Naval Air Reserve squadron and log in flying time on weekends.

The fourth man in the group was James Barnes — fresh out of college and with much to learn about the Navy and aviation. He had entered the pre-flight training under a new program called the Aviation Officer Candidate Program and would take flight training in the Navy as a commissioned officer.

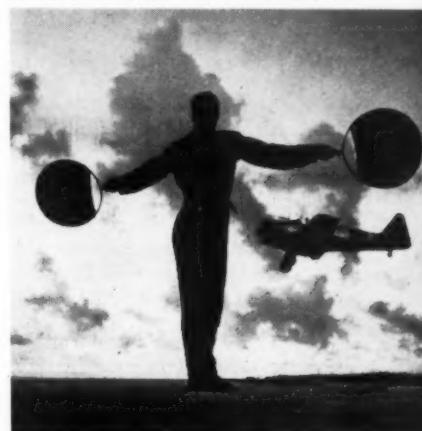
He was starting out as an "Aviation Officer Candidate — Seaman Apprentice" and after successfully completing his pre-flight training he would be commissioned as an ensign and continue his aviation training as an officer.

Previously, college graduates could, after acceptance as an officer candidate, attend Officer Candidate School and after commissioning, apply for flight training leading to the designation of Naval Aviator.

However, the new plan marks the first time in recent years that civilians (college grads) could apply for flight training and go directly to Pensacola



BEGINNING of a new way of life for NavCads who are being shown to living quarters at NAS Pensacola, Fla.



DRY RUN carrier landings are practiced before test at sea. Below: Instructor briefs student on landing pattern.





A FLYER learns about his planes from the inside out in order to make it perform best. Here aviation cadets get the word on SNJ hydraulic system.

and receive flight instructions as a commissioned officer.

The new system calls for successful applicants to be enrolled at Pensacola in the pre-flight school. The pre-flight phase for these candidates lasts 16 weeks and combines officer candidate training, aviation ground school and physical-military training. The AOCs will be commissioned at the end of the four-month pre-flight period as Ensigns in the Naval Reserve and will take the entire flight phase of their training (about 14 more months) with the full pay and allowances of a commissioned officer in the Navy.

(If you know of anyone who might be interested in this program, he may obtain detailed information from his nearest Navy Recruiting Station. Application for the AOC program is made through one of the Offices of Naval Procurement which are located in 27 cities throughout the U.S.)

The four men had entered pre-

flight training from four different directions but they all had the same goal—to become a Navy pilot. For Draper, Prout and Barnes it would be 16 weeks of rugged training duty. And in eight more weeks Ensign Sensi would begin his eight weeks of pre-flight training to fill in the gap between Annapolis, Md., and the Annapolis of the Air.

Located at the main station at Pensacola, the pre-flight school has a double mission. First, it is an officer candidate school for naval aviation. Second, it is designed to adapt future pilots for actual flight training by conditioning them mentally, physically and psychologically for life in the air.

In addition to a vigorous physical program and the process of teaching a sense of naval discipline to the new cadet, academic instruction during this period includes aerology, communications, engineering, gunnery, navigation, principles of flight

and training "flights" in synthetic flight trainers.

When the four future pilots successfully completed pre-flight training they would enter Basic Flight training—still at Pensacola. Here Ensign Sensi and newly commissioned Ensign Barnes were to receive the same training as NavCads Draper and Prout. During Basic Flight they would spend about eight months learning to fly in the Navy's sleek two-seat trainers. Ground courses would continue, but they would actually spend some 180 hours in the air learning basic fundamentals, formation, cross-country, night and instrument flying.

After their first solo flight they moved on to precision, acrobatic and formation flying. There was more ground training, flight briefings and dog fights in the air. Soon they were spouting the "seagull lingo" of naval aviators and had severed the ties between them and the ground—flying was almost routine. Almost, that is, until the time for carrier training came along.

During carrier training they practiced landing on a "mock up" carrier painted on the runway. It was the same size as a real carrier and even had a landing signal officer on hand to direct their landings. To qualify they had to make six field carrier landings and were allowed only six wave-offs—the same number allowed on a carrier.

The day they boarded the carrier for actual ship landings it was a tossup which of the four had more butterflies in his stomach. However, taking off from the carrier wasn't so bad as they had expected and before they knew it, the four were in the

FINAL EXAMS—Landings on CVLs like USS Wright (CVL 49) finish basic training. Right: Successful take-off is made.



air with only the sky and the sea ahead of them. The four planes were joined by two more to form a six-plane landing pattern. The carrier below them seemed transformed into a toy. Ensign Barnes had an impulse to take off for land. He wondered if the others, felt the same way. But when he saw that they were going to go ahead with the landing he figured he'd stay with them. After all, there were seven arresting cables to catch his tail hook before he could hit the four-foot barrier. And if he did go into the drink there was a destroyer and a helicopter standing by to pick him up.

He knew he had learned enough in his survival training to ditch the plane and keep himself afloat until the rescue party came to fish him out.

NavCad Draper was the first to go down. He set a fine example for the rest, landing on the carrier after only one wave-off. The next was Ensign Sensi—he had three wave-offs before he landed. NavCad Prout did it in three, too. Barnes was next. On his first approach he couldn't see the LSO because the nose of his plane obstructed his view. "There must be a joke there," he mused to himself as he flew over and circled back for another try, "Couldn't see beyond the nose of my plane." The second time he was coming in too fast but he did see the LSO. On the third try he slowed down to 55 knots and headed in.

There was the LSO—"Why didn't he signal?" The seconds seemed like hours. And then he saw the flag drop . . . "Cut the engine!" Barnes did but it was just like stopping his heart. It was too late now to do anything but go in. And in spite of all the grim pictures that entered his mind it was a perfect landing.

With the carrier test over (six landings aboard are required to qualify) the men went on to four more weeks of instrument flying before they were moved across the Gulf of Mexico to Corpus Christi, Texas, and Advanced Flight training in jets and other types of combat planes.

They were given a choice between two- and four-engined planes or single-engined carrier-type planes. If they selected the multi-engined planes they would put in 150 hours of air time before being assigned to a Fleet Air Wing. If they selected the single-engined planes they would log 115 hours and then go back to Pen-



IN AFTER-HOUR STUDY sessions classmates get together to work out problems of the day. These NavCads are working on navigation problems.

sacola for two more weeks of practice in carrier landings and take offs in order to qualify for duty with an Air Group.

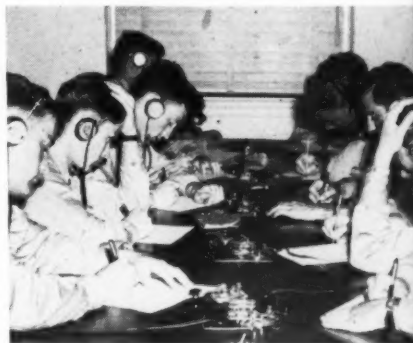
Whatever their choice they would learn to be fighting aviators. In the air, single-engined pilots learn to shoot, bomb and maneuver as part of a team. Multi-engined students learn tactics for attacking an enemy target with bombs, torpedoes and rockets. These four Navy Aviation Cadets chose advanced training in the single-engined planes.

During the remainder of their training they learned that the naval air force is the "knockout punch" of a Navy task force. Planes from carriers not only can knock the enemy out of the sky and destroy his fleets but they can also attack shore installations, fly inland to destroy enemy troop concentrations and supply stations, and make possible the landing of ground forces.

These four men are prototypes of thousands of Navy pilots who have undergone the same training and experience. They all have one thing in common — they are proud of their golden wings and, whether they are land-based, carrier-based or aboard seaplanes, they are proud to be Navy pilots.

Conversely the Navy has reason to be proud of its aviation training program that is turning out the best pilots and aviation experts that can be had. Combined with the sea-going Fleet with ships and planes operating together, the U.S. Navy has an unbeatable combination that is the envy of every nation—the sea and air Fleets ready for offensive action and retaliation.

—Ted Sammon.



NAVY FLYERS must know communications. Prospective aviators practice radio transmission by key in class room.



NEW TRAINERS—T-34B will replace SNJ. Below: T2V Seastar is due to take over TV-2 (rear) for jet training.



LTA—Roving Eye with De

AT LAKEHURST, they like to tell the story of the jet pilot who went for a ride in one of their blimps. When well underway, as a gesture of courtesy, he was offered the controls of the ship. Somewhat curious and slightly scornful, he accepted. Shortly thereafter, the nose began to rise slowly.

Accustomed to the delicate controls of high-speed craft, he gently flicked the wheel forward, then drew back on it easy. Nothing happened. The nose stayed where it was. He again shoved the wheel forward, a little more this time, then pulled back to check the dive. The nose stayed up. A little concerned, he glanced over at his host who was placidly engrossed in catching up with his paperwork. Somewhat desperately, the guest jammed the wheel over in what, to him, was a suicide dive straight into the ground. The nose continued to point up into the great blue yonder.

His host glanced up at the nose, then casually put his foot on the wheel and shoved it all the way forward. He held it there while he continued to write.

Five minutes later, the nose began to drop.

At the end of the cruise, they say, the hot-shot pilot had to be escorted from the ship, a shaken, nerve-shattered wreck.

The story is undoubtedly exaggerated, but it contains an essential

truth. The rest of the Navy just doesn't understand lighter-than-air and is inclined to view it in terms of its own specialization. Heavier-than-air men are disposed to snort at its lumbering 65-knot gait; destroyer men point out that a blimp's hull wouldn't stop a juvenile delinquent with a peashooter. Together, they regard the blimp as a quaint anachronism, not even as picturesque as the cavalry now supplanted by tanks.

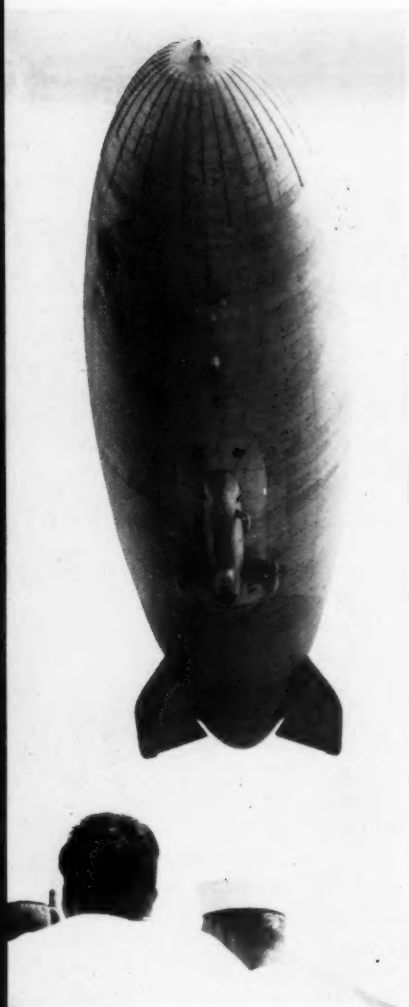
It just isn't so. Far from becoming obsolete, lighter-than-air today is in the opening phase of a brisk renaissance. As a detection arm of an ASW team, the stately blimp possesses the deadliness of a 50-knot destroyer. As an AEW outpost, the vulnerable-looking gas bag can maintain station—in all kinds of weather—far longer than any other type of aircraft.

Just what is a blimp? How does it work? Why is it unique—if it is? What about the men who operate them? Is LTA a special branch of the Navy?

The airship of today is a vastly different creature from the rigids of the 1920s or the World War II non-rigids which did such a magnificent job in protecting shipping against submarines in the Atlantic. If you last saw a blimp during the war, you can forget about it. We're not talking about the same thing.

The present-day airship, most common of which is the ZPG-2 (known

AS SENTINELS OF the sea, Navy blimps operate with the Fleet, often landing on and refueling from carriers.



n Deadly Sting

informally as the Nan-ship) is some 340 feet long with a height of 100 feet. Lift is provided by approximately 975,000 cubic feet of helium, while two 800-horsepower engines mounted inside the cabin give it a speed of 65-75 knots. Actual propulsion is achieved by two propellers mounted on outriggers projecting from each side of the car. In an emergency, either engine can drive both propellers and both engines are accessible for maintenance and repair in flight, if necessary.

The control car, which is approximately 85 feet in length, is a double-decker with crew quarters and a galley (complete with a deepfreeze locker, automatic coffeemaker and electric roaster) above, and all the operational stations on the lower deck. Special equipment permits the ship to refuel in flight from a surface craft or to reballast from the ocean through a water pick-up system.

The car is attached by steel cables to catenaries which run along the top and sides of the envelope. The car is made of aluminum alloy sheet with a balsa wood core. The bag is made of rubberized fabric.

Although a blimp can take off almost straight up when light, it requires a takeoff run when heavily loaded. This was awkward with the old-style tail arrangements to be found in the K-type ships, so the control surfaces of the ZPGs have been moved to a 45° position. However, this presented the problem of snow and sleet collecting in the trough formed between the two upper ruddervators and the ship's body. In the newer model, the ZSG-1, the controls are in the shape of an inverted Y.

The flight controls may be operated manually or automatically. A single pilot may control both vertical and horizontal direction alone or, in cooperation with his co-pilot, may divide the duties of maintaining altitude and direction. All controls can be operated through a single column, which is duplicated at the pilot and co-pilot stations. This, too, is a departure from the earlier ships, which required two pilots to operate the ship.

The airship envelope itself is limp. There is no structural metal in it except in the rudders and elevators. It is the helium in the envelope,



ON PATROL NAVY AIRSHIPS protected Allied convoys during World War II, racking up a record for tracking and sinking subs in Atlantic and Pacific.

which is maintained at two inches of water pressure differential from the atmosphere, that keeps the envelope filled out. However, around the nose of the bag, stiffeners are used. Here aluminum battens, similar to those used in sails, are laced into the fabric so the bow will not be distorted if the blimp has occasion to head into a 70-knot wind.

Just plain, ordinary air is used to give fore and aft trim. The trim tanks, known as ballonets, are located foreward and aft. The ballonet chambers are actually about one-fourth as large as the gas bag. Air is scooped or blown into them as needed and to provide trim, it can be valved either automatically or by manual control.

In the Nan-ship, there is a sight check procedure before landing which helps the pilot in determining whether the ship is nose or tail heavy. A crew member sticks his head up into a plastic glass astrodome in the top of the control car, but instead of seeing the sky he takes his check looking up into the cavernous interior of the gas bag, illuminated by a flood light controlled from the interior of the car. It's an eerie sight.

In spite of its two engines, the blimp has many attributes of the free balloon. Because most of its lift is provided by helium, not power, a blimp can be free-ballooned with the wind for hours if the engines should cut out. Because of the low pressure

(a regulation football takes 180 times the pressure required to maintain envelope shape), gas leakage is slow. Tears in the bag have been repaired while in flight and even serious helium leakage usually means several hundred miles of travel before a landing *must* be made. If need be, they can land almost anywhere. There are no seat belts (except for the pilot and co-pilot) and no parachutes aboard.

A blimp is no toy for the weekend flying enthusiast, for the original cost is about that of a big bomber. However, because its power is used primarily for propulsion and not lift, gasoline consumption is quite low. The average operating cost of an airship is something like one fifth as much as that of a heavier-than-air patrol plane.

Although the military value of the balloon was established in our Civil War and the Franco-Prussian war and as early as the French Revolution, it was not until World War II that the blimp really came into its own.

On 7 Dec 1941, the Navy had only six sea-going, patrol-type airships and only one operational base, at Lakehurst, N. J. There were 5000 miles of continental sea frontiers on two oceans that had to be patrolled and not a single Fleet airship unit in existence.

Later that month, a ship was sunk by a Japanese submarine off the Cali-



DELIVERING a knock-out punch, Navy blimps used depth charges in anti-submarine action during World War II.

fornia coast and German submarines were active on the Atlantic approaches. Ships were being sunk faster than they could be replaced.

In 1942, the situation grew no better rapidly. In the Atlantic coastal areas, 454 merchant ships were sunk. Only 13 airships were available for patrol and escort service. Convoy and anti-submarine warfare tactics were only in the process of development. However, by 1943, sinkings had declined to 65 and, by 1944, had dropped to eight. None of these ships were sunk while under airship escort.

At the peak of operations, in 1944, Navy airships were patrolling about

three million square miles off the Atlantic, Pacific and Mediterranean coasts. During the entire war, 89,000 surface vessels were escorted without a single loss to enemy submarines, although 50,000 of these vessels were operating in areas where U-boats were known to be present. Captured German logs showed that the U-boat skippers had a very healthy respect for their ungainly-looking adversaries. No one suggests, of course, that the airships whipped the submarine menace singlehandedly. It took the combined teamwork of airship, airplane and surface vessel.

To accomplish their part of the job, the World War II blimps made 55,900 operational flights with over 550,000 hours in the air. In doing so, they ran up a startling record of dependability—87 per cent were in operation or readiness at all times.

Despite their apparent vulnerability, only one airship—the K-74—was lost to enemy action. In July, 1943, in the Florida Straits, a U-boat surfaced and shot her down after the bomb-release mechanism in the airship failed to let the bombs go at point-blank range.

In addition to anti-submarine warfare, World War II blimps conducted search operations, observation, photography, mine operations, rescue and general utility.

So do present-day airships. As enemy submarines have improved, so have the blimps. Today, they have

improved range and endurance, techniques for in-flight refueling, provisioning and transfer of personnel, better crew accommodations, improved electronic gear, improved navigational and communications equipment, an auto-pilot and many other new features.

In addition to the previously mentioned functions, two others should be mentioned. The lighter-than-air craft serves as an ideal platform for air and flight testing of aviation equipment, and has been doing so for years. Much of the equipment now found on board the Navy's hottest aircraft was first developed in the gondola of a blimp.

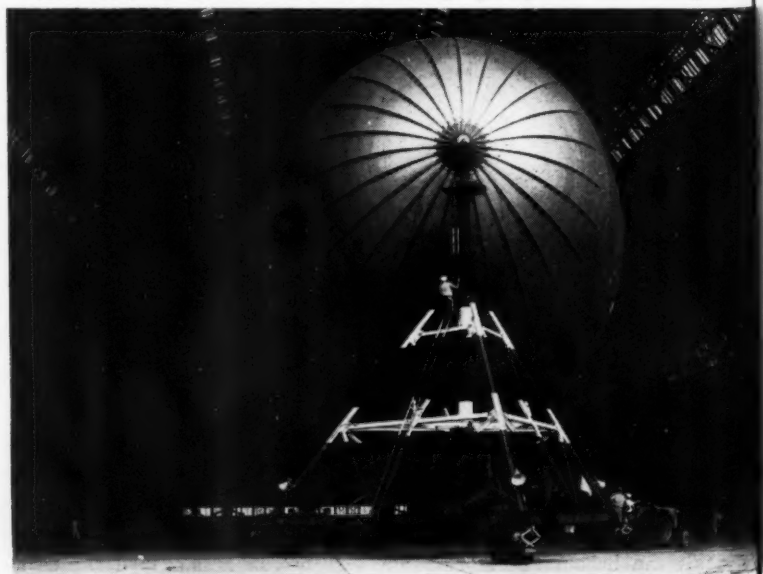
Technicians accustomed to working within the limitation of the more conventional type of aircraft are enthusiastic about the wide range of possibilities offered them by the sturdy and relatively roomy blimp.

It is this long-range stability that also makes lighter-than-air an important component of the aircraft early warning teams.

Lighter-than-air men claim that the blimp, with its ability to hover and carry more and larger types of detection equipment than the airplane, is superior to its teammates as a sub spotter and warning craft.

They may have a point. It was a Nan-ship that, in 1954, set a sustained flight without refueling record of more than 200 hours and in doing so, won for its skipper, CAPT Marion

LIGHTER-THAN-AIR Navymen secure K-type blimp to mobile mast and carefully 'jockey' her into hangar.



ALL HANDS

H. Eppes, the 1955 Harmon trophy. It would seem that the only reason why a blimp should now return to its base is for a major overhaul or the completion of its mission. Or, as they say about *Nautilus*, once every four or six years to enable the crew to re-enlist.

Routine training or operational cruises for blimps now range from two to four days. The watch system for long hops is usually set up as four hours on and four hours off. LTA pilots say that the fastest way to muster all hands on deck is to shut off the engines. The startling silence brings everyone awake and down the ladders in an instant. Much more efficient than passing the word over the intercom.

The men who handle these ships are really little different from any other Navymen. To many, LTA is just another tour of duty. To others, it is a way of life, and they would like to make a career of it. Most like the duty, some do not. LCDR Baker, maintenance officer of ZP-3, for example, has been an LTA man during most of his entire naval career and hopes to stay with it until his retirement. His experience goes back to the days of the *Macon*, when he was one of the pilots who experimented with the hook-on of light planes. The senior CPO, Wiley, was one of the line-handling crew of the ill-fated *Hindenberg* when it made its fatal landing.

LTA pilots are really heavier-than-

air men gone light-headed. They are all qualified heavier-than-air pilots who have received additional training and who, usually, alternate one two-year tour of duty in LTA with one similar tour in HTA. When they have an option, they usually request further LTA duty.

Although Lakehurst is still the major center for lighter-than-air activities, many of its pilot-training functions have been transferred to Glynco, Ga. Here, student pilots receive their preliminary LTA training, which includes the highspot of every LTA pilot's indoctrination—the free balloon flight, an experience which provides anecdotes for years to come.

However, here again, training in free balloons is more than merely keeping up with a pleasant tradition, for every pilot must understand and respect the power of the wind and must realize that a blimp without power is literally a free balloon and must be handled as such.

Aerodynamics, aerostatics and navigation are emphasized in the three-month special course. The major change in approach from HTA to LTA is in the manner in which air is considered. The airplane pilot is taught to consider it as a flowing medium; the lighter-than-air man considers it as resembling water in which a lighter body can float.

Until recently, LTA training of enlisted personnel was conducted by means of special courses at Lakehurst. At present, all training, other

than rate training, is made available to selected personnel by means of operations with the Fleet. However, plans are now underway to provide further specialized training early this summer through the use of mobile trainers.

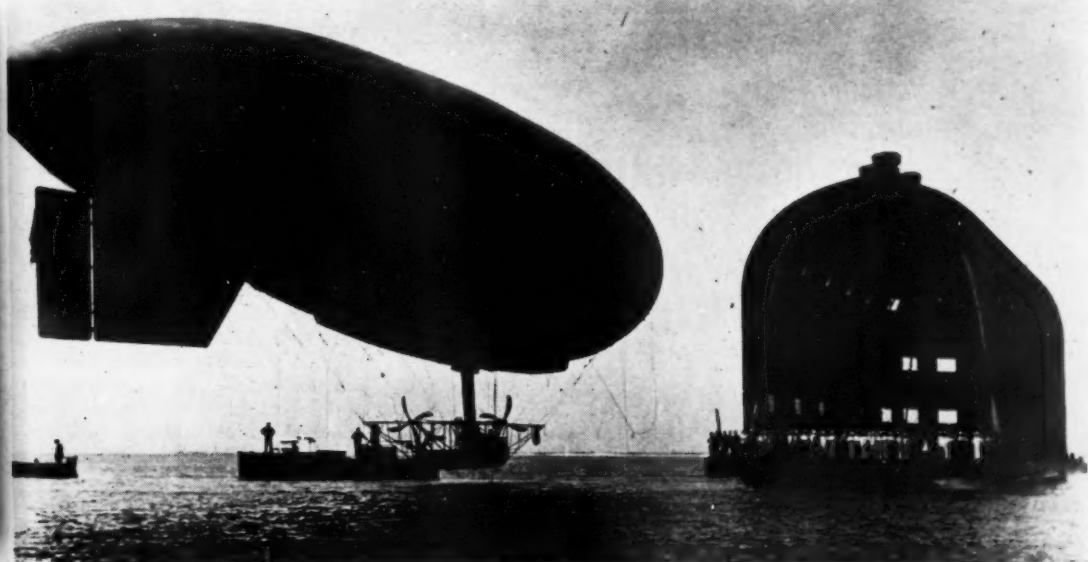
The following ratings are included in the flight crew for AEW airships: aviation electrician's mate (AE); aviation machinist's mate (AD); aviation structural mechanic (AM); air controlman (AC); and aviation electronics technician (AT). Additional ATs and sonarmen (SO) are included in the typical ASW air crew.

On the ground, the following ratings are employed: Aviation machinist's mate (AD); aviation structural mechanic (AM); aviation ordnanceman (AO); parachute rigger (PR); aviation electrician's mate (AE); photographer's mate (PH); aviation electronics technician (AT) and airman recruit (AR).

If you are in one of these ratings and LTA sounds like the duty you want, you might make application for a billet to Commander, Atlantic Fleet, via your chain of command. If you're qualified and there's a billet open, you'll find it to be interesting and unusual duty.

One further point which is indicative of the New Look in lighter-than-air—line handling crews are just about a thing of the past. They've been mechanized. Mechanical mules, in the form of tough tractors, equipped with winches, have taken their place.

NAVY LTA has come a long way since this dirigible (DN 1) pulled out of her floating hangar in 1917.



MARCH 1956

They're Ready for Full-Time Duty

"WEEKEND WARRIORS"—the men who make up the Naval Air Reserve—are an important segment of the naval air force and of the expanding Naval Reserve program.

Now in its fourth decade, the Naval Air Reserve program has come a long way since its inception.

The program was put to its first major test in World War II when thousands of "Weekend Warriors" became full-time Navymen, fighting on all fronts of the global war.

During the Korean conflict, the Naval Air Reserve really paid off. Some 42 Reserve Air squadrons were activated, including carrier squadrons, patrol squadrons and FASRons.

In March 1951 the first all-Reserve air group, operating from *uss Boxer* (CVA 21), hit the Korean front. Naval Air Reservists also played a

major role in the activities of *uss Princeton* (CVA 37) and *uss Bon Homme Richard* (CVA 31). About half of the patrol squadrons fighting in Korea were activated Reserve patrol squadrons. Of 8000 combat sorties flown during a typical month's operation in Korea, approximately 75 per cent were by activated Naval Air Reservists.

When the Naval Air Reserve program got underway more than 30 years ago, there were 4000 Reserve officers and 20,000 enlisted men on inactive duty—all veterans of World War I. With a budget of little more than a half million dollars, the plan called for the establishment of seven units, capable of training about 500 pilots a year.

On 13 Aug 1923, the first Naval Reserve Aviation Base was estab-

lished at Squantum, Mass. It boasted two seaplanes, one officer, one rigger, two machinist's mates and a carpenter on full time active duty. It had a small hangar, motor overhaul stand, a small machine shop and a motor boat. It could train a dozen or so pilots a year.

Today the Naval Air Reserve Training Command is made up of 21 Reserve Naval Air Stations and seven Naval Air Reserve Training Units which are located in important population centers of the country. More than 36,000 Reservists take part in the program, supported by active duty Reservists in the TAR program. (TAR stands for Training and Administration, Naval Reserve.)

An air wing staff and a number of squadrons and units are located at each of the 28 activities. There are also 84 Auxiliary Air Units (AAUs) and 33 Auxiliary Ground Units (AGUs) currently assigned. In addition there are 17 BARTUs—Bureau of Aeronautics Training Units.

Let's take a look at a typical air station in today's Naval Air Reserve. NAS South Weymouth, Mass., which replaced the pioneering activity at Squantum a year or so ago, may be considered an average-sized Reserve NAS. At the present time it has one air wing staff, five fighter squadrons, four anti-submarine, two patrol, four transport, one lighter-than-air, two helicopter squadrons and one CV FASRon taking part in its 48-drill program. Its 24-drill program includes four AAUs and two AGUs. There is also one BARTU, in the 12-drill program.

According to recent statistics, NAS South Weymouth has about 47 officers and more than 443 enlisted men on board as stationkeepers. That's quite a change from the one officer and four EM of the 1923 era.

Planes and equipment have taken on a "new look," too, as the Reservists follow the trend toward powerful jet-propelled aircraft.

Today's Air Reservists get up-to-date training with the latest available equipment. Jet-powered aircraft are replacing the outmoded prop-driven planes in ever-increasing numbers.

Reserve fighter pilots fly F9F-6 and F9F-7 *Cougars* and F2H *Banshees*. They are replacing F4U *Corsairs*.

Attack squadrons use modern AD

IMPORTANCE OF NAVAL AIR RESERVE was exemplified in Korean conflict where they served on all carriers. Here, pilots and crews rush to ready planes.



ALL HANDS



KEEPING UP WITH THE TIMES, Reservists are now piloting jet fighters like these F9F-6 Cougars.

Skyraiders and jets. Members of anti-submarine squadrons will find the TBMs and AFs being replaced by the S2F, beginning early in fiscal year 1957. Patrol squadron pilots are flying P2Vs and the P4Y *Privateer*. P2V *Neptunes* have replaced almost all of the older PV *Harpoons*. Transport squadrons are using late model R4D-8 twin-engined and R5D four-engined planes.

The training program is geared to handle this transition from conventional aircraft to jets. The Chief of Naval Air Reserve Training is authorized to permit additional 14-day periods of active duty for training to enable each pilot to receive more training for the switch-over from props to jets.

Enlisted Air Reservists are also kept abreast of the latest developments in the field of aviation. Back in 1950, the Naval Air Reserve Training Command began a system of accelerated training for airmen. The program encompasses two levels of training—one for advancement to airman apprentice and airman, the other to petty officer third class.

Reservists who attend the 85-day Recruit Airman School are given a standardized AA exam during the course and the AN exam at the end of the training period. Upon "graduation," those who qualify are advanced to AA and, after six months in pay grade E-2—if they fulfill all drill requirements—they are advanced to pay grade E-3.

Students at the Basic Rate School are given a locally prepared exam at the conclusion of their course. If qualified, they are advanced to PO3 after completing six months in pay grade E-3 and fulfilling the necessary drill requirements.

It's easy to see that training "Weekend Warriors" is no hit-or-miss affair.



AVIATION ORDNANCE CHIEFS receive training in latest weapons. Below: White hat of reserve FASRon unit makes repairs on jet at NAS Norfolk, Va.

The Naval Air Reserve program is divided into three groups in terms of the number of drills authorized annually, in a pay status—48-, 24- and 12-drill units. All are under the cognizance of CNARESTRA, the Chief of Naval Air Reserve Training.

• **48-Drill Program**—This program is composed of squadrons and air wing staffs performing 48 drills a year in a pay status. The drills are scheduled in groups of four and are held one weekend each month. "Weekend Warriors" spend 14 days on active duty for training (ACDUTRA) each year at Fleet activities or at other air stations of the NARTC. During this time the squadrons conduct flight operations as self-supporting units.

The number and type of squadrons and units authorized depend primarily on the number of qualified naval officers and men available for training in a given area as well as facilities for air training. The types of squadrons assigned also depend





NAVAL RESERVE air crewman works on communications equipment while on training assignment with his unit.



DURING TRAINING CRUISE on board USS *Intrepid* D. Nicke, ADC, USNR, makes repairs on jet turbine. Below: Weekend Warrior crew prepares for flight.



upon the operational experience of the available aviators and upon mobilization requirements.

The 48-drill program now includes 94 VF (Fighter) squadrons, 43 VA (Attack), 34 VS (Anti-Submarine), 27 VP (Patrol), 2 VP(P) (Patrol Photo), 38 VR (Transport), 54 FASRons (CV and multi-engine support), 8 ZP (Lighter-than-air) and 11 HU (Helicopter) squadrons, thus providing a type squadron to meet the operational qualifications of every naval aviator.

At the present time, more than 7600 officers are assigned to air wing staffs and squadrons, including about 5200 naval aviators and more than 2400 ground and staff officers. Some 26,000 enlisted men are assigned to the program. As is the case with all Naval Air Reserve programs, authorized allowances and planning for future growth provide for substantial increases in these figures.

• **24-Drill Program**—Air Reservists in this program make up Auxiliary Air Units and Auxiliary Ground Units. They attend 24 drills annually in a pay status and spend 14 days on active duty for training with pay. A maximum of 48 drills may be prescribed by the Chief of Naval Air Reserve Training, with any drills in excess of 24 to be without pay. AAUs may be located at the parent NAS or NARTU or at an auxiliary air field.

The pilots of AAUs are naval aviators who are prevented by civilian occupation (or distance) from attending 48 drills yearly or who do

not meet the operational flight qualification requirements for affiliation with the 48-drill program. They drill as a group and, upon mobilization, would serve as flight instructors, ferry pilots, or in other support activities.

The Auxiliary Ground Units are composed of aviation ground officers and men who possess ground specialty qualifications. They perform monthly drills at Naval Air Stations, Surface Reserve Training Centers, Air Force facilities and other military or nonmilitary establishments. The 14-day active duty for training period is spent working in their specialty or attending advanced schools. When mobilized, they will be assigned as individuals in special fields.

Included in the 33 currently assigned AGUs are 17 Air Intelligence Specialist (AI) units, one Photo Interpretation Specialist (PI), one Photographic Specialist (PHOTO) and one Combat Information Center (CIC) unit.

More than 1100 naval aviators are assigned to AAUs and AGUs, along with about 500 ground and staff officers and 800 enlisted men.

• **12-Drill Program**—This program is composed of Bureau of Aeronautics Reserve Training Units (BARTUs). Members include officers and enlisted personnel who have qualifications for specific mobilization billets in BuAer or its field activities.

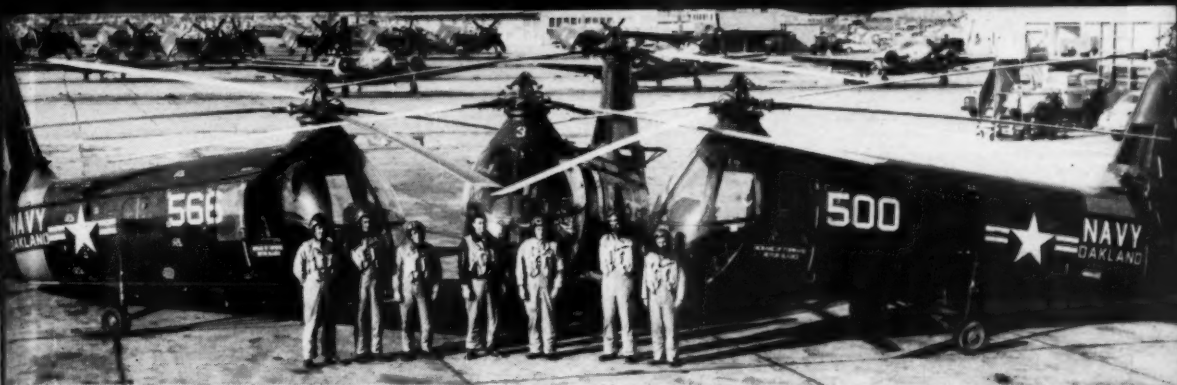
Officer code designators in 13XX and 15XX groups are authorized. Not more than 20 per cent of any BARTU officer allowance may be filled by naval aviators.

Although a maximum of 12 paid drills annually is prescribed, units should schedule at least 24 drills a year. Members are authorized to take active duty for training each year, with pay and allowances. When possible, they perform ACDUTRA in their mobilization billets.

There are now 17 BARTUs meeting regularly throughout the country, with about 200 officers and a number of enlisted men participating.

The value of this complex training program was more than evident in World War II and the Korean conflict.

Today, from recruit to flag officer, on the ground and in the air, the Naval Air Reserve is continuing to prove itself a competent, progressive component of the Navy—ready for any emergency that might come.



COPTER PILOTS and crew of HUP-2, NAS Oakland, line up in front of their craft after rescue operations.

Air, Sea, Land Teamwork Saves Flood Victims

THE RAIN WAS HEAVY and the day was very dark as Navy helicopters hovered over raging brown waters hoisting cold, wet people to safety as floods swept over Northern California in what has been described as one of the worst disasters in the state's history.

More than 200 lives were saved by Navy helicopters alone. Men, women and children of all ages were hoisted 50 to 60 feet into the air and into the safety of the helicopters. Flight after flight was made carrying from one to four flood victims each trip.

Navy helicopters flying from naval air stations at Oakland, Alameda, Moffett Field and Monterey are credited with saving 43 lives in the Guerneville area, rescuing 143 in and around Yuba City and hoisting 27 to safety from the Eureka-Arcata flooded area. Helicopters from the Coast Guard and from commercial firms in the area also played a prominent part in the rescue operations.

In addition to their rescue work the Navy helicopters transported doctors, nurses and medical supplies throughout the stricken area. They rushed emergency cases to hospitals, even landing on the hospital lawns, where necessary, to deliver their cargo. The whirlybirds also carried insulin to diabetics isolated by the flood waters and badly in need of the extract. They carried food, milk,

fresh water and blankets to people in areas cut off by the raging waters.

The helicopters even acted as "storks" during the disaster. In one instance a Navy helicopter spotted a white cross made out of sheets in a front yard near Salmon Creek. After landing in the front yard the pilot discovered it was a signal for help from a woman momentarily expecting a baby. She was immediately loaded into the helicopter. The pilot took off for the Garberville Airport, but found that the landing strip there had been isolated from the town. The only spot available turned out to be a drive-in theater where he landed as gently as possible and hailed a passing motorist who took the woman to the hospital—just in time.

Although the helicopters performed various tasks during their rescue operations, everywhere they went the scene was the same. Railroads, bridges, highways, homes, automobiles and livestock had been washed away. People were perched on rooftops, makeshift rafts, sawmills, in trees and on every spot that wasn't covered by water. And rescue operations were hindered by telephone wires, trees, antennas and the extremely bad weather.

Besides the helicopters, hundreds of Navymen, with planes, trucks, busses, small boats, blankets, cots

and communication facilities turned to in the battle against the floods.

At Palo Alto, a Moffett Field Navy weasel (amphibious vehicle) carried to safety 12 people who had been marooned by the high water. Moffett Field also provided emergency housing to flood victims.

A Navy P2V *Neptune* from NAS Oakland flew 4100 pounds of blankets to Arcata, and four of the Navy's SNB Beechcraft airplanes were sent to Arcata to aid the post office in getting mail to isolated areas.

Fifteen rubber lifeboats and 200 cots were rushed from the Naval Supply Center in Oakland to the Stockton area and portable pumps were furnished by naval activities throughout the flooded sections to pump water from cellars.

Navymen in every part of the disaster area joined civilians and Army personnel to fill and place hundreds of sand bags to hold back the swollen rivers.

From the Naval Magazine at Port Chicago dump trucks, a mobile crane and a rock loader were rushed to the Martinez district to aid civilian defense workers there.

Navy radios immediately turned out, aiding in communications, and Naval Reservists in the area turned out to keep the messages moving. It was an all-out effort by the Navy in a battle against nature's violence.

TYPICAL OF FLOOD areas where Navymen rushed to give assistance is this photo of Yuba City—Marysville area.





BACK THROUGH THE YEARS—At left are FJ-3 Furies of Korean war. Right: WW II SBD Dauntless dive bombers return.

Record of Conquest: Navy

IMAGINE A PILOT and passenger sitting on the lower wing of a 1913 "hydro-aeroplane" flying over the ocean. The plane, like most planes of the day, has no cockpits, no seats, no safety belts, and only a few inches of fabric-coated frame separates them from the water below.

Suddenly the plane noses down; one of the men immediately drops from view, while the other—a real "cool cucumber"—grabs the strut he is sitting beside and hangs on while the plane completes a wild, spinning 1600-foot plunge into the water. Pulled out of the drink by a nearby ship and rushed to a hospital, he not only recovers—he returns to flying duty.

That incident actually occurred on 20 Jun 1913, and the cool daring, the hang-on-and fight attitude of LT John H. Towers (the man who rode the plane down), has characterized the entire history of the Navy's flying service, from the day in 1898 when Assistant Secretary of the Navy Theodore Roosevelt recommended that the government look into the possibilities of aircraft, until today when you can see the world's largest carrier cruising off the Virginia capes, watch one of the world's largest flying boats—a Navy *Mars*—shuttling between Hawaii and California, or read about any one of the dozens of pioneering steps in aviation initiated by the Navy.

The history of your Navy's aviation branch actually goes back about a dozen years before the Navy even owned a plane, back to Teddy Roosevelt's advice in 1898. On his recommendation a board was appointed to look into the possibilities of combin-

ing air and sea operations, but their favorable report did not meet with universal approval. After all, it would be several years yet before the Wright brothers flew their first plane, so no wonder an aviation program seemed a little premature.

Other early attempts to interest the Navy in aircraft met with the same stumbling block. By 1908, however, numerous followers of the Wrights had built and flown their own craft and the Navy had several men who were well-informed about aviation.

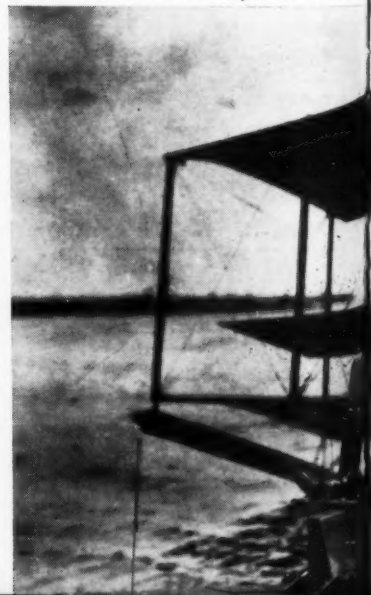
A naval observer at an international aviation meet in 1909 noted in his report of the event great military possibilities for the aeroplane and proposed modification of a *Connecticut*-class BB into a "carrier." In 1910

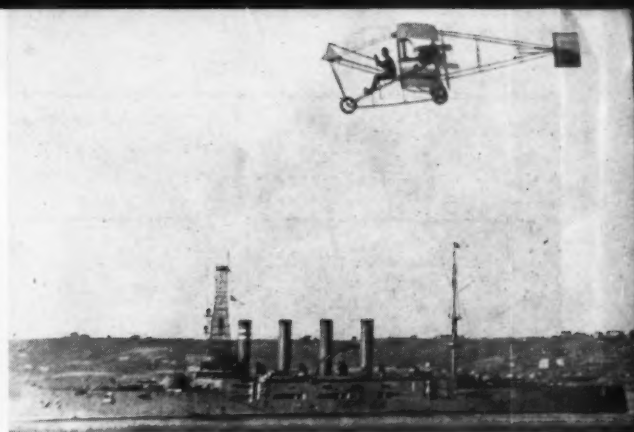
pioneer airman Glenn Curtiss declared that "the battles of the future will be fought in the air! The aeroplane will decide the destiny of nations!"

After watching a bombing attack put on by Curtiss, another naval observer noted that for military purposes planes still had plenty of defects, including dependence upon almost perfect weather, the impossibility of approaching an enemy without his being forewarned by the noise of a plane in flight, to say nothing of the difficulties of controlling altitude and speed so as to predict range, or working at a height great enough to give the plane a fighting chance of reaching an effective range.

Even so, Captain W. I. Chambers

AIR PIONEERS—Sleek *Skyhawk* and gear of record-breaking pilot LT Gordon Gray, USN, contrasts with LT P. N. L. Bellinger, USN, in AH3 *Curtis* plane, 1915.





BIPLANES OF WW I make training flight. Right: One of Navy's new planes in 1912 flies over USS West Virginia.

Pioneers in the Air Ocean

was assigned in late 1910 to "keep informed" on aviation progress and was authorized to offer recommendations to the Navy Department. In short order he proposed buying a number of planes for experimental purposes and the creation of a separate office of aeronautics. Despite opposition encountered on many sides, Chambers finagled use of the cruiser *Birmingham* and the services of Eugene Ely—number one pilot for Glenn Curtiss—and proceeded to pull off the first ship-to-shore flight. That was on 14 Nov 1910.

A few days later, Curtiss offered to train a naval pilot in his plane—for free. The offer was accepted and the Navy had its first official student pilot, LT Theodore G. Ellyson.

On 18 Jan 1911, shortly after

Ellyson had joined up with the Curtiss-Ely team, Ely made the first "arrested landing" on the armored cruiser *Pennsylvania*, then turned right around and flew back to the beach. These experiments and others were sufficiently convincing for Congress, on 4 Mar 1911, to appropriate \$25,000 for the Navy's first planes.

Then naval aviation began to move a little faster:

- Two land planes and an amphibian were ordered in 1911, and pilots and mechanics were ordered to train for their operation. Among these men were such pioneers as LT John Rodgers and the aforementioned LT John H. Towers.

- The first naval airfield was built near Naval Academy at Annapolis.

- Experiments to find some work-

able catapult device were begun, with an eye to making the Navy's air force an integral part of the sea service.

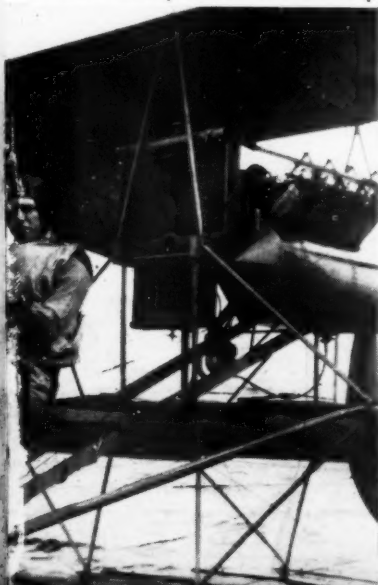
Work—and results—with this mid-get air force gave Chambers and the Navy enough talking points to get the Navy's second appropriation for aviation upped to \$65,000. Pioneers in any field must take chances with the unknown, the untried; and the Navy's fledglings were no exception. They attempted various means of catapulting planes, submarine and mine spotting, and conducted tests (mostly simulated) with the Fleet in screening, bombing and aerial photography.

Despite the bigger appropriation and demonstrated successes, however, the naval air force moved slowly, working against a lack of enthusiasm in some cases and hostile opposition in others. A 1913 report to the General Board listed for the Navy's air force the small total of eight planes in commission, 13 officer pilots, one air station and one reserve field.

The same 1913 report which listed the Navy air force's strength contained enough favorable information, however, to make the Board overlook a lot of opposition. After studying that report, the Board decided (14 years after Roosevelt's initial recommendation) to "get hot" on naval air. "Getting hot" was for the time being mostly a paper matter, unfortunately, since Captain Chambers still had no power except to make recommendations, and no steps were taken to set up any sort of aeronautics department. Even so, the General Board's

(Continued on page 40)

OUT IN THE OPEN—Pilot of early plane (left) and test pilot flying new experimental rocket-powered one-man copter both experience plenty of fresh air.

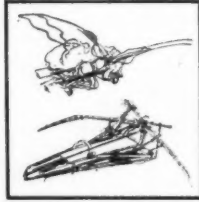


HIGHLIGHTS AND HISTORY

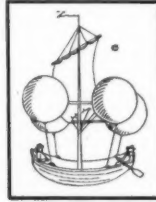
EARLY TRIES IN HISTORY



POWER TO FLY has been man's earliest dream. Mythology and religious beliefs reflected this age-old desire. Icarus and Daedalus go aloft



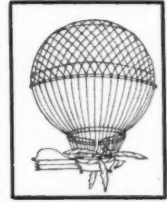
DAVINCI in 1508 derived this inspiration from nature—careful study of birds in flight.



IN 1670, de Lana's air boat without propellers had merit, did not work.



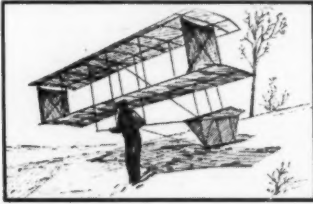
HOT-AIR, paper-and-linen balloon of Montgolfier flew in 1783



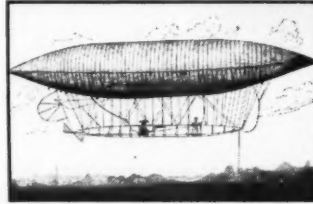
BLANCHARD in hydrogen bag made first air voyage in America, 1793.



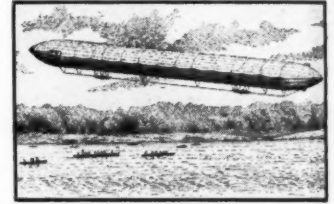
HEWSON'S Aerobag, 1842, never had essential features



CHANUTE BIPLANE GLIDER—Built by Octave Chanute, a civil engineer from Chicago, in 1897, this glider secured vital improvement—stability.



SANTOS-DUMONT'S early experiments aided the development of the non-rigid airship. In 1898 he was first to apply the gasoline engine for aerial use.



RIGID AIRSHIP design was introduced by Count Zeppelin. His ship in 1900 had two 16-hp engines and succeeded in reaching a speed of 20 mph.

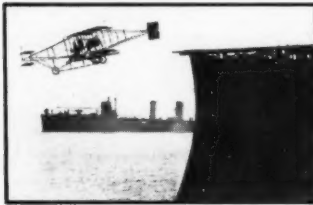


WRIGHT helped to develop that was

NAVY'S FIRST DECADE AND WORLD WAR ONE



CAPT W. I. CHAMBERS lead Navy in first aeronautical experiments.



FIRST FLIGHT from the deck of a ship. Pioneer pilot Eugene Ely sets pattern for aircraft carrier take-off from *USS Birmingham*, 14 Nov 1910



EUGENE ELY, test pilot, provided information on shipboard operations.



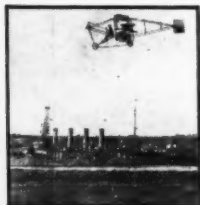
LT THEODORE G. ELLYSON, Naval Aviator No. 1, set to fly "crate."



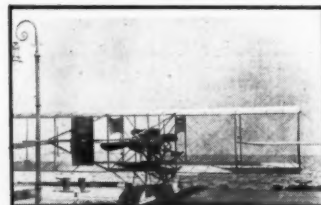
NAVAL AVIATOR NO 2 was CDR. J. Rodgers shown in 1926 gear.



LT (later ADM) ELLYSON learned to fly a flimsy 1911



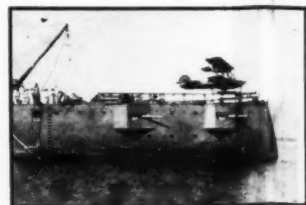
PLANES like this 1912 craft were among the first steps in building the sea-air Navy.



EFFICIENT CATAPULTS were based on experiments at Annapolis in 1912. Operation involved use of a cradle which was also launched, but free of plane.



SWEPTBACK WINGS of old Burgess-Dunne AH-7 hydro-aeroplane of 1913 find modern manifestation in the F7U and other streamlined jets of today.



FIRST CATAPULT on a warship. AB-2, piloted by LCDR Mustin, is shown leaving the catapult of *USS North Carolina* during trials in 1915.



NAVY'S FIRST DIRIGIBLE approaching its floating hangar. The DN-1 marked the introduction of lighter-than-air craft into the naval air force.



PARACHUTE PRACTICE from observation balloon introduced as part of airmen's training



NAVY'S WW I "ACE" was LT D. S. Ingalls, assigned to RAF, 1918.

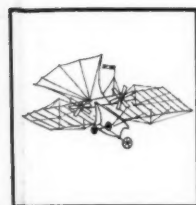


OBSERVATION KITE balloons invaluable aids to Navy's mission—protection of convoys.

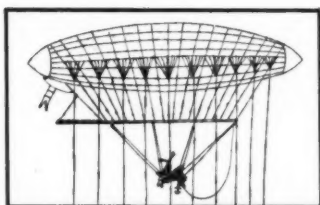


F5L PATROL plane was popular in Navy's first decade. In production during World War I, these flying boats of 1918 did real

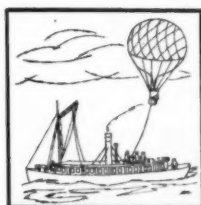
TORY—THE FLYING NAVY



HENSON'S Aerial Steam Carriage. 1842, never constructed, had essential features in design.



COAL GAS lifted Giffard's airship, France, 1852. Powered by steam engine and screw propeller, this first semi-rigid balloon proved to be navigable.



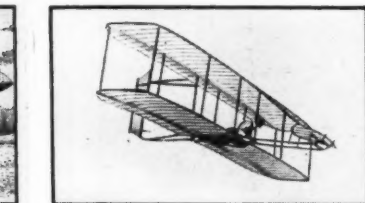
1861 NAVY EXPERIMENT—carrying balloons for observation purposes was transport Fanny.



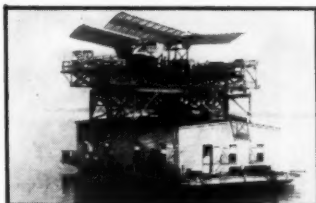
FIRST CARRIER was USS George Washington Parke Custis, 1861.



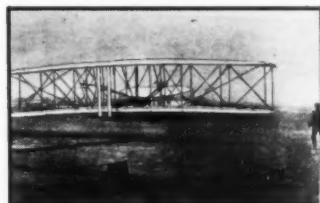
LILIENTHAL, 1895. German pioneer of gliding flight, was early, significant contributor.



WRIGHT GLIDER of 1902. Gliding experiments helped to design and evolve a system of control that would enable stability to be maintained.



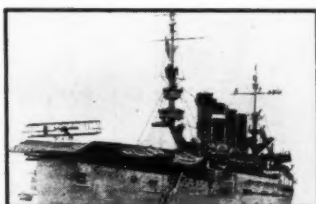
LANGLEY'S AERODROME failed in October and December tests of 1903. Believed to be aerodynamically sound, its launching device proved faulty.



FIRST FLIGHT ever made by man in a power-driven, heavier-than-air flying machine made by Wright brothers at Kitty Hawk, N. C., on 17 Dec 1903.



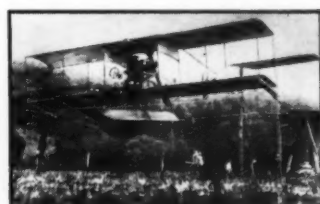
LT (later ADM) TOWERS learned to fly in a flimsy 1911 plane



BASIC IDEA of this first landing on a ship is still used. Platform and canvas barrier on USS Pennsylvania are shown. Date: 18 Jan 1911.



FIRST "ARRESTING GEAR" on the cruiser Pennsylvania is tried out by Ely. Careful arrangement of 22 lines across the deck, with sandbags, worked.



NAVY'S FIRST PLANE, the amphibious A-1, is seen as it is successfully launched from a wire by Elyson at Hammondsport, N. Y., September 1911.



AB-3, piloted by Ely, was popular in Navy for a time during World War I, a few of 1918 did reach Europe.



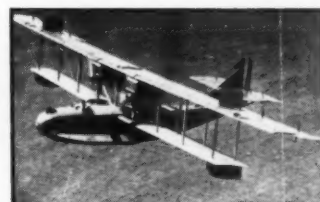
LT P. N. L. BELLINGER was another Navy "early bird." Later, at Vera Cruz in 1914, he became first naval aviator to receive bullet holes in his plane.



COMMUNICATIONS in 1917 were aided greatly by feathered heroes, the carrier pigeon.



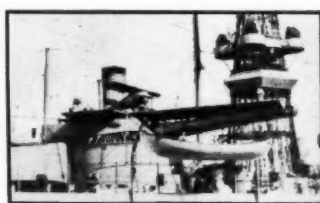
FIRST NAVAL aerial photographer was W. L. Richardson (left), seen at Pensacola, 1914.



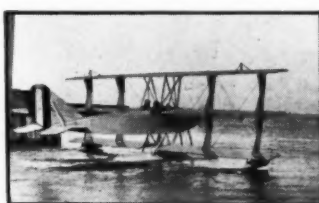
H-16 NAVY BOMBER, used overseas in World War I in North Sea area, still retained box-like design of early planes but forecast shapes to come.



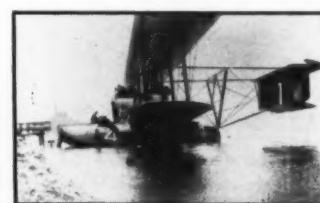
PLATFORM ON GUN TURRET could be rotated to insure a favorable wind for successful launching. Plane in ready position on USS Oklahoma.



TRIPLANE was one of the experimental aircraft developed as a result of the Navy's interest in scientific achievement and planning for future.



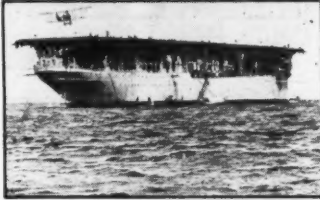
FIRST TRANSATLANTIC FLIGHT in 1919 was made by one of three NCs that tried—the NC-4. Route was to Plymouth, England, via Azores and Lisbon.



THE TWENTIES PERIOD OF IMPROVEMENT



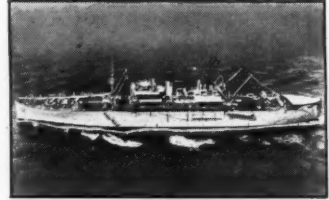
RADM WILLIAM A. MOFFETT, first Chief of Bureau of Aeronautics, organized in 1921.



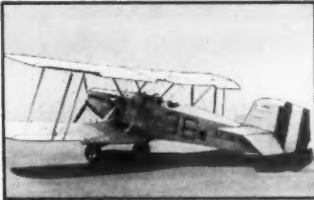
AEROMARINE APPROACHING USS Langley during landing practice, 1922. LCDR G. deC. Chevalier, who made first landing on it, used same type plane.



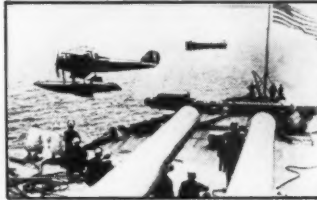
FLIGHT DECK scene of Navy's first carrier, USS Langley, shows similarity to present technique.



FIRST SEAPLANE TENDER, USS Wright (AY-1), was a logical step in developing new uses of seaplanes learned as result of World War I operations.



SC-1 MARTIN BOMBER and torpedo plane of 1925. Torpedo technique had improved, as planes became heavier, faster, more dependable.



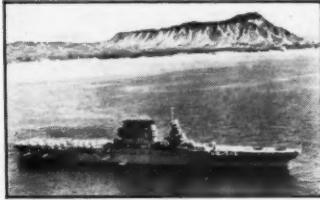
VE-7 SEAPLANE leaving turntable catapult on USS Maryland. This plane also made the first flight deck take-off under its own power from a carrier.



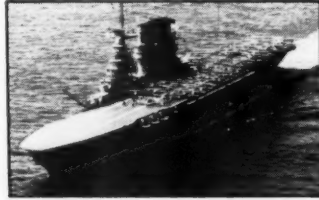
HIGHLY VERSATILE aircraft of the 1920's was the early Corsair. They were used for observation, as two-seat fighters, and as dive bombers.



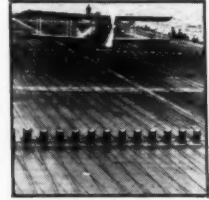
FIRST FLIGHT over North Pole made by CDR Richard E. Byrd and Floyd Bennett, May 1926.



FLATTOP CONVERSIONS of cruiser, battle-cruiser hulls yielded valuable information in planning future carriers. Here is USS Lexington CV2.



USS SARATOGA CV3, another converted battle-cruiser hull. Her performance greatly contributed to the development of future fighting carriers.



FIRST LANDING on USS Saratoga by LCDR Marc Mitscher in 1928. Arresting gear improving.

THE THIRTIES PERIOD OF DEVELOPMENT



K-CLASS BLIMP, built as a training ship in thirties, was prototype of WW II airships.



OP-1 AUTOGIRO of 1931 was the Navy's first rotary winged aircraft. It saw test service in valuable experience with Marines in Nicaragua, 1932.



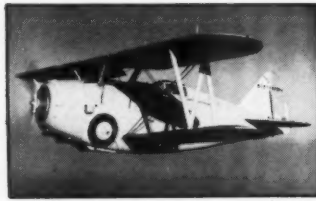
XTSM-1 MARTIN DIVE BOMBER of 1930. The production models were designated BM-1 and were the first dive bombers to carry 1,000-pound bombs.



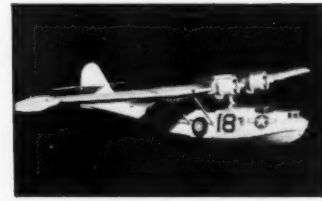
USS MACON, one of Navy's largest dirigibles, served as flying hangar for F9C-2 fighter.



FIRST NON-STOP MASS FLIGHT between San Francisco and Pearl Harbor was made in 1934 by a group of P2Y-3s. Later served as trainers.



LAST BIPLANE FIGHTER and the forerunner of the Grumman Wildcat was single-seater F3F. This model and modifications were standard fighters.

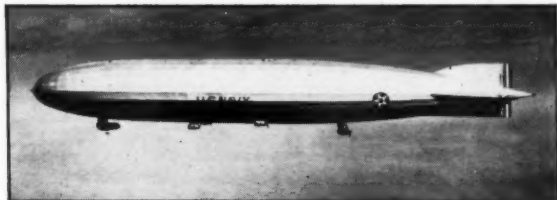


PBV-3A CATALINA—This patrol bomber became the basic patrol plane of WW II. PBV's stacked up remarkable records since purchase in 1935.

FLYING NAVY *continued*



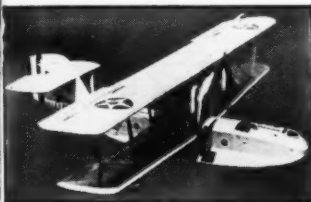
ONE OF NAVY'S ENTRIES in the Curtiss trophy race in Detroit, Mich., October 1922 was this Curtiss 18-T. This triplane had 400-hp engine.



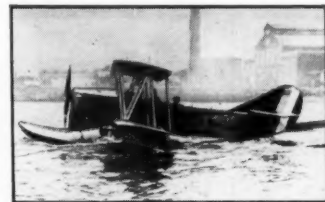
NEARLY AS FAST as airplanes in that era and with many times their range and endurance, rigid airships promised bright future in aviation development. Attention was brought to bear on aviation and its potential power. Above is the ill-fated Shenandoah.



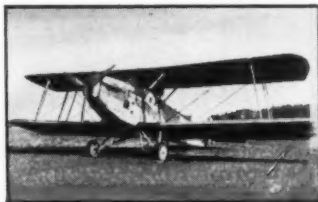
DT-2, TORPEDO PLANE, 1923. Torpedo bombing, recognized early as a tactic, has paid off.



CALIFORNIA TO HAWAII was goal of CDR John Rodgers in flight of two PN9s. Even though forced down at sea, he established new distance record.



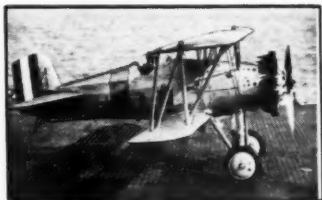
NAVY AMPHIBIAN, OL-2, one of the three planes used to conduct aerial exploration with CDR Donald B. MacMillan's Arctic Expedition, 1925.



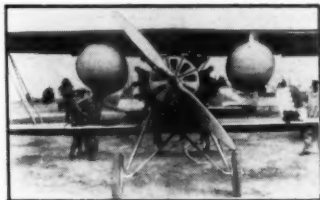
MARTIN BOMBER, 1926—The T3M, a modification of the plane shown, was the first torpedo plane widely used aboard carriers, and one of the largest.



TG-1 GREAT LAKES was rugged two-seat biplane torpedo bomber with fixed landing gear.



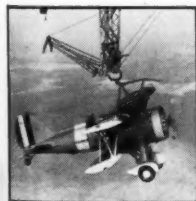
F4B-1 BOEING FIGHTER, developed in the late 1920s, was popular airplane with Navy pilots during the 1930s and was standard for the period.



FLOTATION BAGS are inflated in this 1928 experiment. New ideas and courage were still needed to increase safety and efficiency of naval air force.



FIRST OVER SOUTH POLE was flight by RADM Richard E. Byrd as climax of 1929 expedition.



HOOKING ON and taking off during flight from mother dirship, Macon, trick of F9C-2's.



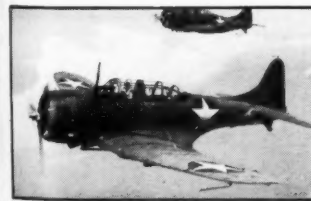
FIRST AIRCRAFT CARRIER built as such from the keel up. All others before 14,000-ton USS Ranger were skillful conversions. June 1934.



SOC-1 SEAGULL served on old battleships and cruisers as scout and observation planes, operated from catapults. Fitted with wheels in port.



N3N YELLOW PERILS were primary and advanced trainers. Pontoons made them seaplanes.



SBD DAUNTLESS—First produced in 1937, it was first monoplane dive bomber. Later it delivered a smashing attack on the enemy at Battle of Midway.

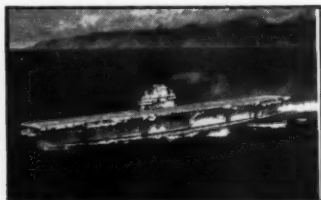


TBD-1 DEVASTATOR of 1937 was heaviest carrier-based naval aircraft and only torpedo bomber in operation in the late 1930's and early WW II.



F2A-2 BUFFALO was the first monoplane fighter to go into service use. Ordered in 1938-1941, it was flown by Marines in opening phases of WW II.

WORLD WAR TWO



USS YORKTOWN (CV 10), incorporating many improvements, was commissioned in 1943, as namesake of CV 5, which was sunk at Midway, June 1942.



USS ENTERPRISE, sister ship of the Yorktown, gave good account of herself in early days and all through WW II. She received the PUC and NUC.



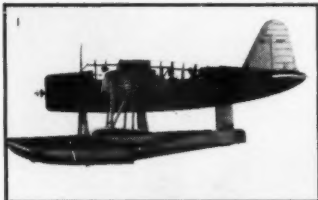
REFUELING AT SEA. Top seamanship met dare of this vital operation. Essex class carrier.



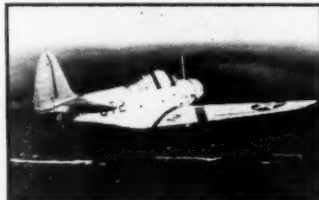
LSOs were used on the old Langley in 1922. But many new jobs came with developments.



F4F-3 WILDCATS were first Grumman monoplane fighters. Original design was for biplane.



OS2U KINGFISHER was developed in 1937, went into production in 1941. Performed as patrol and rescue operational plane during early years of war.



TBD-1 DEVASTATORS were first produced in 1936, but served as the Navy's standard torpedo bomber well into 1942. Participated in Battle of Midway.



SBD DAUNTLESS, famed scout bomber, fulfilled its mission in dive bombing, search and patrol.



SEAPLANE TENDERS in World War II provided great mobility for patrol, air-sea rescue and other seaplane operations, serving as floating bases.



F6F HELLCAT distinguished itself as a day fighter and later as a night fighter in Pacific.



PBM MARINERS flew patrol, ASW missions, used JATO technique [jet-assisted takeoff].



WARTIME AIR TRANSPORT requirements were met by turning to production of modified commercial heavy-load carriers such as four-engine B30.

POSTWAR YEARS AND NEW DEVELOPMENTS 1945-1950



PB2Y-3 CORONADO, used on patrol and bombing missions during war, were also part of fleet of NATS serving as transports during war and demobilization.



R4D SKYTRAIN, widely used by Naval Air Transport Service, carries cargo up to seven tons.



MIDWAY CLASS, commissioned in 1945-47, profited in design from war years. This class includes USS Midway, Franklin D. Roosevelt and Coral Sea.



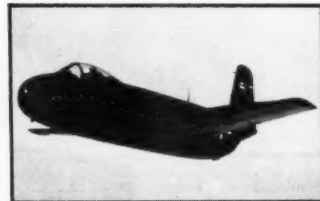
F8F BEARCAT set a new record for rate-of-climb in 1946, 10,000 feet in one min. 34 sec.



FD-1 PHANTOM, first jet fighter (along with FR-1) for carrier use, flew over 500 mph.



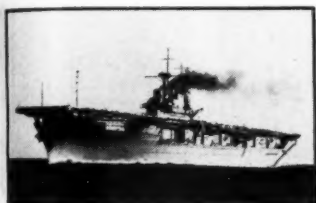
NAVY'S SKYSTREAK, high-speed research plane, proved itself with two world's records.



F6U PIRATE, small lightweight-design jet fighter, is made of special material, consisting of a sandwich of thin aluminum sheets bonded to balsa wood core.



P4M-1 MERCATOR was designed for long over-water patrols, even though a land-based plane. Is powered by two jet and two reciprocating engines.



USS WASP, one of nine pre-war carriers [ordered 1935, commissioned 1940], delivered planes to Malta in Mediterranean, lost at Guadalcanal, 1942.



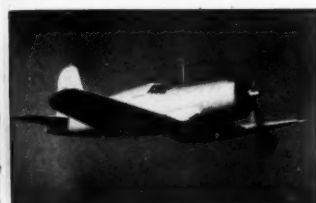
USS HORNET, keel laid in 1939, won fame. Launched bombers in attack on Tokyo.



ESCORT CARRIERS, designed to meet needs of war, became integral part of post-war Navy.



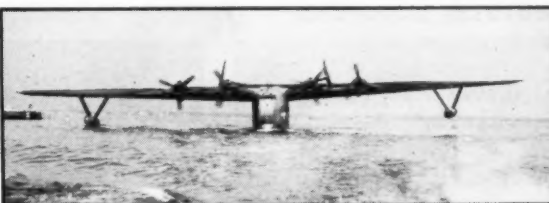
INDEPENDENCE CLASS carriers were light cruisers converted in 1940-42. Teamed with Essex class, they delivered smashing attacks in World War II.



IMPORTANT DEVELOPMENT in 1940 was the XF4U-1 Corsair which was first Navy plane to top 400 mph. This fighter has lasted longer than any.



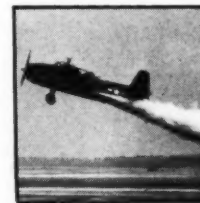
THE SB2C HELLDIVER entered war late in 1943 in attack on Rabaul shipping and defense.



JRM MARS, the giant cargo flying boat of the Naval Air Transport Service, shattered four world records on its first war mission in 1943. This 70-ton "flying Liberty ship" flew a 35,000-pound cargo of war materials 8792 miles with average speed of 161 mph.



PB4Y-2 PRIVATEER, famed workhorse of the World War II Navy, proved its versatility through bombing, air-sea rescue, transport and patrol missions.



AVENGER tests JATO takeoff. Designated TBF or TBM, it was important carrier plane.



BLIMPS and other lighter-than-air craft, inflated with nonflammable helium, were invaluable.



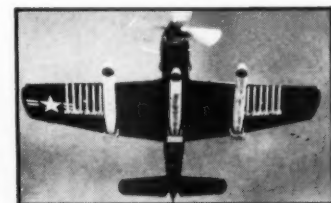
PB4Y-2 PRIVATEER entered combat in 1945, designed especially for long-range patrol in Pacific. It operated effectively against shipping and subs.



MOTHBALLING aircraft carriers, as well as aircraft, a post-war chore that proved practical.



P2V NEPTUNE, an antisubmarine plane, set world's record for long-distance flight. In 1946, one nicknamed the "Truculent Turtle" flew 11,236.6 miles.



AM-1 MAULER, attack plane, designed to carry 4,000-pound bomb load and take off on a 400-foot run. Actually carried heavier loads plus rockets.



FR-1 FIREBALL, one of Navy's first major jet experiments. Prop-driven, jet unit in tail.



F7U CUTLASS, a radical twin jet with delta-form wing and vertical fins, 650 mph or better.



F3D-1 SKYKNIGHT was the first jet fighter designed for all-weather operation. Long range and high speed give it outstanding versatility.



F2H BANSHEE, a twin jet carrier-based fighter plane, was replacement for Phantom. They are armed with four 20mm nose guns. Top 50,000 feet.



XPSY-1, FIRST TURBOPROP seaplane in U. S. powered by these Navy-pioneered engines.

KOREAN OPERATIONS



F7F-2 **TIGERCAT**—Gross weight 13,000 lb. Used in Korea, has speed over 425 mph, 1500-mile range.



THE **F9F SERIES** of jet aircraft include three "cats," the *Panther* above, and *Cougar* and *Tiger*.

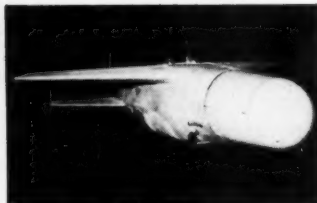


OE-1 **BIRD DOG**, Marine observation plane at Korean front.

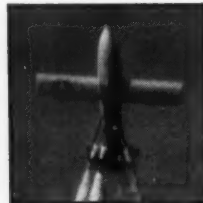


F4U **CORSAIR**—Used in low-level ground support, night flying.

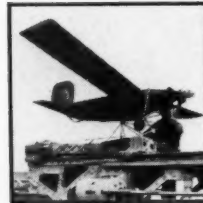
GUIDED MISSILES



BAT—Radar-guided bombs hit Japanese shipping targets miles away. Carried by Navy *Privateers*.



LOON—Navy guided missile launched from ships and subs.

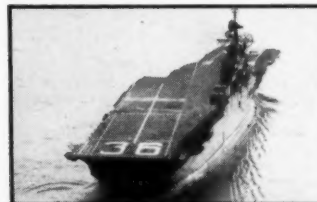


RADIO-CONTROLLED target drones simulate moving planes.



REGULUS, launched from *Princeton*, carries its own landing gear. Uses *JATO* for quick pickup.

PRESENT



USS ANTIETAM (CVS 36) with angled deck permits greater safety in carrier flight deck operations.



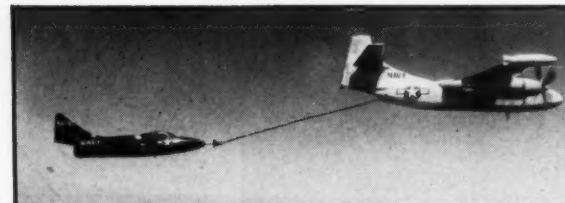
F9F-6 **COUGAR**—Swept-wing successor to *Panther* jet is a day fighter, in the "over-600-mph" class.



P5M-2 **MARLIN**—New "T" tail gives better slow speed control.



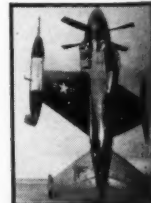
AF-25 **GUARDIAN**—Anti-sub plane, long range, good speed.



REFUELING IN FLIGHT becomes routine after successful tests. Here is a *F9F Panther* taking on jet fuel from an *XAJ-1* tanker plane. Technique will increase fighter range.



XF3H-1 **DEMON**—Single jet swept-wing, all weather fighter, radar and fire-control equipment.



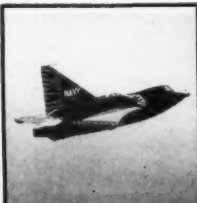
XFV-1 takes off, lands vertically, flies on level.



JET-ASSIST makes *Skymaster* air-borne. Specially equipped plane takes part in Operation Deepfreeze.



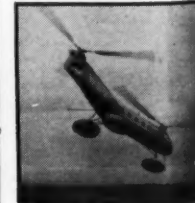
S2F **SENTINEL**—Effective sub-killer may operate from carrier.



XF2Y-1 **SEADART**—A delta-wing seaplane, faster than sound.



XFY-1 **POGO** makes vertical take-off, landing.



H-21, aerial minesweeper, can also pull grounded boats clear.

HELICOPTERS



HO4S-1—Standard carrier-borne attack aircraft. Weight 20,000 lb, speed over 300 mph.



HTL-4, Utility copter, served in Korea, is rated as a trainer.



HRP-2 RESCUER—All metal, carries 2-man crew and litters.



HO4S-1—Called "The Workhorse of Korea."



HUP-1 RETRIEVER, shipborne copter, has outrigger tail fins.

REMOTE CONTROL



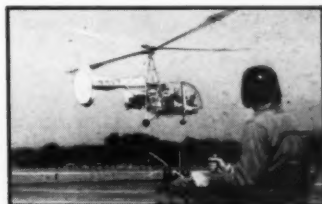
V-1—Research rocket obtains weather data.



GORGON—Air-to-air missile is slung underneath a Navy PB4Y ready for an experimental flight.



HELLCAT converted into drone is handled by radio control box.



DRONE HELICOPTER with emergency pilot aboard is being manipulated by ground control operator.



F-4 FURY—Versatile carrier-based jet, has near-sonic speed.



AJ-26 SAVAGE—Powerful carrier attack plane, 50,000 pounds.



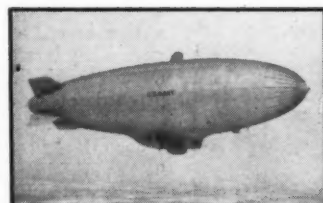
R3Y TRADEWIND—America's first turbo-prop seaplane, transport has more than 22,000 horsepower.



P2V-NEPTUNE—Long-range patrol plane has take-off weight of 58,000 pounds, range over 3500 miles.



A-1 SKYHAWK—This midget atom bomber is tiny but potent.



ZPG-2W AEW AIRSHIP—Airborne Early Warning lighter-than-air craft are fulfilling vital roles today.



XP6M-1, SEAMASTER, World's first four-jet seaplane cruises at 40,000 feet, capable of speeds over 600 mph. Its missions range from mine-laying to photo reconnaissance.



F-4 SKYRAY is a tailless, sweptback jet, designed for interception and is catapulted from carriers.



F-4 is search-warning version of R7V Super Constellation, plays big role in continental defense.



FLYING platform controlled by weight shift.



USS FORRESTAL (CVA 59), latest in flattops, will launch largest and heaviest carrier aircraft.



AIRCREW make mechanical check up and gas up jets lined along the edge of deck of *USS Boxer* (CVS 21).

(Continued from page 31) stated intention increased interest in the program, and more attention was given to pilot and crew training.

The immediate result of this Board's meeting was the creation of a naval aeronautics office, under Captain Mark L. Bristol (Chambers had been retired, but was retained on active duty). Other steps were the assignment of the battleship *uss Mississippi* as an experimental aviation vessel, and the creation of a naval air station at Pensacola, Fla.: As World War I progressed in Europe and both sides began using their

latest aviation developments, naval observers were sent overseas to study foreign aviation.

Then, in March 1915, with the possibility of American entry into the war increasing, Congress appropriated \$1,000,000 for naval aviation, while authorizing the President to create a National Advisory Committee for Aeronautics. The legislative body also increased the authorized allowances for flight personnel and liberalized their flight pay. In July of the same year training classes, which had come to a halt during the Vera Cruz operations, were resumed at Pensacola (it had begun training in January 1914); and experimentation with available plane types and warfare techniques proceeded apace.

In March 1916, CAPT Bristol transferred his command from Washington to assume command of *uss North Carolina* (an armored cruiser which had replaced *Mississippi* as an experimental ship), but he was still assigned additional duty as supervisor of all naval aeronautics, aircraft and air stations. With *North Carolina's* four planes, Bristol carried out a number of exercises which were highly instructive in building planes that would more nearly fit the Navy's specialized needs.

Finally, in June 1916, the General Board issued the results of a serious three months' study of naval aviation's possibilities. While they recommended spending \$5,000,000 on aviation during the coming three years, and had many positive conclusions to support the allocation of this amount, they were still of the opinion that aviation in the Fleet ap-

peared likely to be confined to a subordinate role. They also concluded that aerial bombing was too inaccurate to be of any value except against land targets.

The "dedicated men" in naval aviation, however, continued their work right up until the U. S. joined forces in World War I. Chambers, Wilkinson, Mustin, Saufley and Rockwell, McCrary and Maxfield (the latter two in LTA) and Towers (who had been checking up on aviation "over there") were important names during the period.

That first world war brought into being a naval air force that consisted of 68 stateside and overseas installations—including 11 training stations where there had been only one in operation at the beginning of the war—and a total of nearly 37,500 aviation personnel (both officer and enlisted), as compared to some 300 just before U. S. entry into the war.

From the day Navy birdmen landed in France in June 1917, through their first flights in July, and some 22,000 following flights, they racked up an outstanding record—considering the scarcity (and crudeness) of the few planes available. On their beginning flights, Navy pilots were flying foreign planes, some of them too light to carry machine guns, or bombs. Despite such handicaps the Navy's air force patrolled over 800,000 nautical miles and dropped over 100 tons of explosives. This was done by 1147 officers and 18,308 enlisted men—with only 19 casualties.

Immediately following World War I, the use of *uss Shawmut* (CM 4), a minelayer, as a seaplane tender gave a big boost to the integration of aviation with the Fleet. Experiments with *Shawmut* were successful enough to lead to the assigning of another minelayer, *uss Aroostook* (CM 3) as the Pacific Fleet's tender. These makeshift tenders were followed in December 1921 by *uss Wright*—an unfinished wartime hull which was completed for her specific assignment as a tender. These craft made it possible for flying boats such as the H-16s to operate with the Fleet.

Then came the carriers. On the basis of British successes with carriers commissioned in 1918 and 1919—and recommendations of numerous Navy flying officers—the General Board in 1919 OKed conversion of a collier into a carrier. Result was the recommissioning of *uss Jupiter* as *uss Langley* (CV 1) in March 1922.

F-BOAT PILOTS OF WORLD WAR I wearing flight gear of the day rev up the motor of their flying boat as they prepare to evacuate combat wounded.



ALL HANDS

The early and middle Twenties saw a number of important happenings in naval aviation:

- Captain William A. Moffett succeeded to the directorship of naval air in March 1921, just in time to become (on 12 July) the first chief of the newly-created Bureau of Aeronautics.

- Bombing experiments with several obsolete Navy ships and captured German craft gave the Navy air and ship branches valuable information on bombing techniques and the effect of hits and near misses on various types of ship hulls.

- Dive bombing was being pushed to a higher degree of effectiveness, mostly by Marine fliers.

- The evolution of plane types specifically designed for shipboard operation, and the development of missions, continued. By 1922 Navy-men were using bombers from torpedo squadrons both for torpedo work and for such tasks as tractor duty and spotting.

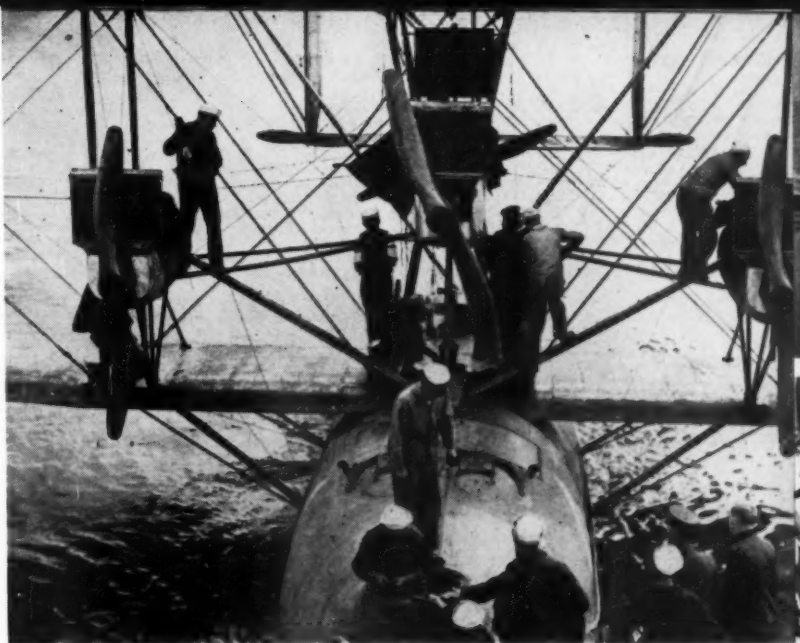
- Different kinds of arresting gear were tested, with the result that *Langley* by 1923 could handle something like three planes in ten minutes.

- Catapults using compressed air and, later, powder charges, were tested in a variety of positions aboard different ships, leading eventually to the flush-deck compressed air types used in the Thirties.

- In August 1925 the Navy (which had already flown the first plane across the Atlantic in May 1919) launched the first serious attempt to fly the broad expanse of the Pacific—and wound up with one of naval aviation's most unusual stories (See page 53).

- Lighter-than-air experiments, which had begun with endless talk and recommendations, had progressed through the Navy's first "free" balloon (in 1915), kite balloons, the "A," "B" and "C" type airships of the WW I period, and the ZR dirigibles, including the German-built *Los Angeles* (ZR 3), which became one of the Navy's most successful dirigibles.

Although the Navy's first carrier, *uss Langley*, had proved herself too small, too slow, and lacking in adequate facilities, she was a beginning and she made an admirable test vehicle for two vessels under construction, *uss Lexington* (CV 2) and *uss Saratoga* (CV 3). These two hulls, originally laid down as battle cruisers, were slated for scrapping



NAVYMEN MAKE FINAL check on NC-4 Curtiss flying boat in 1919 as they prepare it for first trans-Atlantic flight. Flight was from Newfoundland to Portugal.

under the Washington Naval Treaty of 1922. Their conversion was possible under the treaty's allowance for nonexistent carriers.

With the commissioning of "Lex" and "Sara" in late 1927, the U. S. Navy not only had the world's largest carriers, she could also lay claim to the most up-to-date aircraft and a system of training which was producing highly skilled pilots and enlisted personnel, all achieved by the "hang on and fight" philosophy of such men as Towers. Participating in the Fleet exercises of 1929, these two carriers helped demonstrate the effectiveness that aviators had long been claiming for their craft. Other exercises in 1930 and 1931 furnished answers to hundreds of questions about combined sea-air commands.

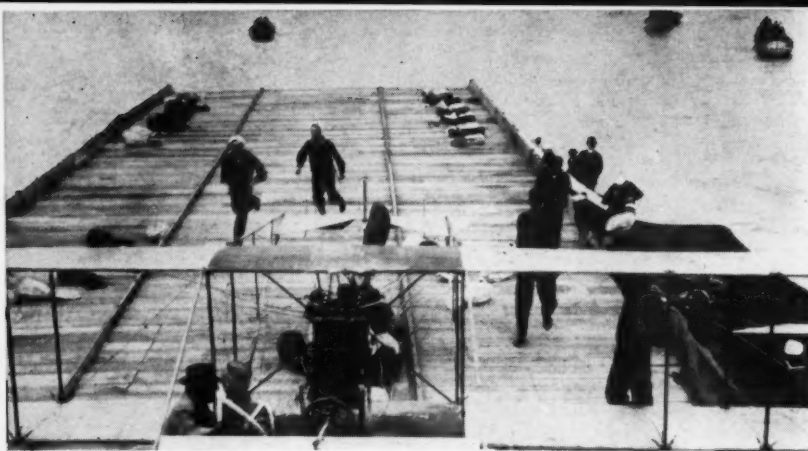
The Navy got Congressional authorization for an additional flattop—the 14,000-ton *Ranger* (CV4) which was launched in February 1933 and had the honor of being the first Navy ship to be designed and built as a carrier. Sufficient funds were also provided to permit laying down *uss Yorktown* (CV 5) and *uss Enterprise* (CV 6) in mid-1934.

Right along with the upswing in the carrier outlook, relief measures of the troubled Thirties provided the Navy with improved air station facilities around the country, while the Navy-industry brain and talent pool continued to design and produce planes and equipment especially suited to shipboard use.

In the later Thirties the pressing need for tenders to "mother" the

PLANE CAPTAIN TO PILOT—Enlisted plane captain gives 'Plane ready to go' signal to pilot of jet fighter preparing to take off at NAS Jacksonville.





FIRST ARRESTED LANDING on temporary deck of armored cruiser USS *Pennsylvania* is met by men who were forerunners of present day aircrewmembers.

Navy's growing fleet of patrol planes resulted in conversion of *Langley* and a number of destroyers to that duty. These were followed (in 1938) by plans for building two large and six small tenders between 1938 and 1941. By then all treaty limitations on armament had been forgotten.

That man who "hung on" back in 1913—and who had continued to set an example for the Navy's air personnel—now RADM Towers—was chosen to head the Bureau of Aeronautics in 1939, just in time to use his valuable experience in shaping up naval air power for the battles which lay ahead.

By mid-1940 the Navy had approximately 1700 aircraft and 2965 pilots. Plane types of the period included the F4F *Wildcat* (in production), the F4U *Corsair* and the F6F *Hellcat* (well along in the design stage); all were to make names for themselves in the coming war.

In mid-1941 *uss Long Island* (CVE 1) (formerly AVG 1) was commissioned as the first escort carrier. Converted from a commercial hull, she was the first of a long line of small seagoing airfields which were to see service in World War II.

In December 1941 naval air power consisted of some 5000 aircraft, 8 carriers of various sizes, 34 tenders (of which 10 had been designed and built for their job) and approximately 30,000 personnel—not much of a force, considering what was to come. By the date of Japan's surrender, that force consisted of some 41,000 planes, 437,000 personnel (approximately 61,000 of them pilots) and 99 carriers.

As war flared in the Pacific, the Navy's rapidly expanding air force carried out innumerable raids and tangled in two major battles with the

enemy from Pearl Harbor through the Battle of Midway. Their effectiveness was instrumental in turning the defensive Pacific war into one of limited counterattack in late 1942. From then until war's end Navy airmen played a major part in the fight.

- They provided much of the air support in the Aleutians.

- Fast, new *Essex* and *Independence*-class flattops struck Marcus, Wake, the Gilberts, the Marshalls and the Mariana Islands—in fact, they participated in every major battle and campaign in the Pacific after August 1943.

- Carriers covered Philippine operations in 1944 and 1945.

- They provided air support at Iwo Jima and Okinawa, launched raids on the Japanese home islands and were standing by when the enemy surrendered.

War in the Atlantic was quite different from that in the Pacific, but the Fleet's flyboys were no less active. Patrol aircraft worked effectively to reduce the submarine menace. Carriers covered the Moroccan landings in 1942. They escorted convoys, in an antisubmarine warfare tactic which reduced the German undersea fleet by 36 subs, and enabled our troop and cargo vessels to ply their trades unmolested. Carriers also covered the landings in southern France in 1944, while battleship and cruiser aircraft spotted for naval gunfire.

But volumes have already been written about naval aviation and its part in the conflict; in brief, carriers and their complements played a distinguished part in every phase of the war at sea. They had led the victorious campaign across the Pacific, sweeping aside enemy aerial opposition, sinking warships, destroying supply vessels, and assisting the

hard-pressed soldiers and Marines fighting the ground war. PacFLT's air force, at war's end, could balance the loss in aerial combat of 451 carrier planes against an enemy loss of some 12,000 planes. Navy and Marine ground units accounted for another 3000 enemy planes. And carrier aircraft sank 711,256 tons of war vessels and some 1,390,000 tons of enemy merchant shipping. Only 11 carriers were lost out of a total of 110. Six of these were unarmored escort carriers; the 10,000-ton *Princeton* was mortally wounded during the Battle for Leyte Gulf and four others were sunk in 1942, before carrier task group tactics had been devised.

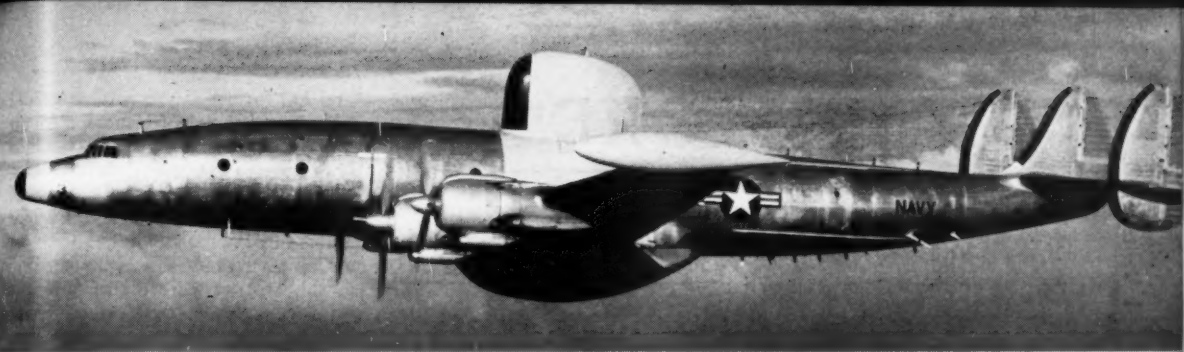
A brilliant war record for sure. The end of war brought with it new challenges, but the Navy was already on the way to answering many of them. Advanced techniques in moth-balling processes had to be formed. The development of planes adapted to the necessities of carrier operation, yet the fighting equals of any in the world—the development of carriers strong enough and long enough to handle these new planes—the difficulties of carrier flying with jet planes having slow acceleration and high landing speed—these were some of the problems faced in post-WW II.

At the same time Navy task forces, each built around one or two carriers, were supporting U. S. policy in the Mediterranean and in the western Pacific. So it was that *uss Valley Forge* (CV 45, now CVS 45) found herself launching air strikes shortly after 25 Jun 1950, the date on which communist forces launched their attack against South Korea. Since UN forces already had control of the surrounding seas, the carriers concentrated on supporting the land campaign and taking part in the air offensive. From October 1950 until hostilities ceased in July 1953, a task force with two to four carriers remained continuously at sea off Korea, to launch planes in support of ground troops, cut communication lines and attack industrial and supply centers.

But yesterday's carrier strikes and bombing missions are a fading memory; today's are merely drill. Aviators of the caliber of Mustin, Saufley, Towers and the late Marc A. Mitscher have become names in history. But the naval air force they fought with—and for—is today perhaps the most important element of your Navy.

—Barney Baugh, JO1, USN.

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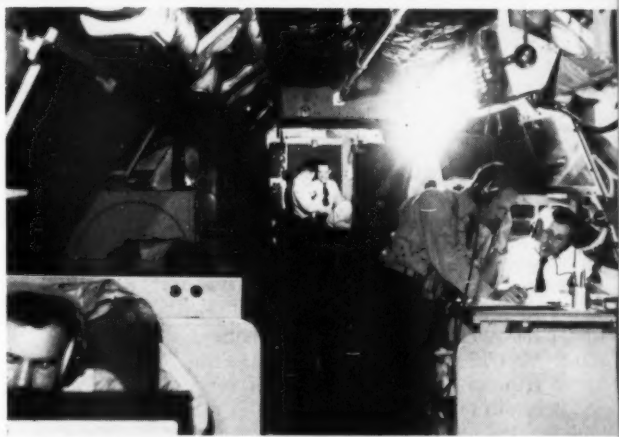
Airborne Dragnet

A FAR CRY from our country's first early warning system—comprised of two men, horses, lanterns and a church steeple—is the Navy's new Airborne Early Warning Wing operating out of NAS Patuxent, Md.

Today's "Paul Revere of the Navy" has the same purpose, but he watches for enemy attack from a much higher vantage point as the WV squadrons patrol the sky out over the Atlantic's waters in WV-2 *Super Constellations*. AEWINGLANT has the specific mission of providing an aerial radar patrol barrier over the Atlantic.

More comfortable, too, than an old church steeple is the atomic age lookout duty, for among the complicated radar and electronic detection gear have been tucked the comforts of home. Facilities for the crew included in this flying radar station are an electric galley, bunks, and a lounge with tables and reclining seats.

Top: Modern Paul Revere rides high in WV-2 Super Constellation. Top right: Crew members man their stations in the CIC room. Middle right: Target sighted during training flight is plotted. Lower right: Fried eggs breakfast is prepared on electric stove in plane's modern galley. Lower left: Crew members relax during off duty hours of extended flight.



THE WORD

Frank, Authentic Advance Information On Policy—Straight From Headquarters

• **FLYERS NEEDED**—The increased requirement for junior officer ranks of Navy pilots has resulted in a call for requests for active duty from pilots in the inactive Reserve.

Applicants for active duty must agree to remain on active duty for at least three years and may, if they desire, request retention beyond the minimum period or integration into the Regular Navy.

Inactive officers, who have been on inactive duty for less than a year, can request integration into the Regular Navy at the same time they request active duty. Those who have remained on inactive duty for more than 12 months are not permitted to request integration until after they return to duty.

Because of the shortage of junior officers, it has been pointed out that the career opportunities for Reservists, who answer the call and return to duty, will be greatly enhanced. The shortage of lieutenants and other junior officers means that promotions will be faster and that the best qualified men will be getting more important billets sooner. It makes an attractive promotion picture.

Another inducement to the Reservists concerned is the announcement that a majority of aviators recalled will more than likely be given a tour of shore duty as their first assignment after recall, giving them a chance to get back into the swing of things before going to sea.

Interested Reservists should submit their applications to the Chief of Naval Personnel (attn: Pers-Bllr), via their district commandant or the

Chief of Naval Air Reserve Training, as appropriate. Other details can be found in BuPers Inst. 1331.4.

• **FLYING DUTY FOR WAVES** —

Enlisted Waves in pay grade E-3 who have not received service school training are needed for flight orderly duty in Air Transport Squadrons on both coasts. Since this duty involves flying, only volunteers are accepted.

Applicants must not weigh more than 130 pounds, must have a clear record, enjoy meeting the public and must have served at least one year at their current duty station. Interested volunteers should contact their personnel officer for further information.

• **FEDERAL INCOME TAX** — Navy-

men everywhere are reminded that the Federal Income Tax return deadline is 15 April—unless you are living or traveling outside the U. S. or its territories, in which case you have until 15 June to file a return.

Although some naval personnel—because of exemptions and deductions—will not actually pay taxes, a return must be filed if your gross income is \$600 or more. A return also must be filed before you can get a refund on the withholding tax the Navy is required to take from your pay.

To help you make out an accurate return your ship or station has available Forms 1040 ("long form") and 1040A (known as the "short form," but now a business machine card),

and has furnished you with a "W-2" form, a statement of wages paid you and taxes withheld. Also available are copies of the BuSandA pamphlet "Federal Income Tax Information," which tells what you need to know about the income tax laws.

Completed forms should be mailed to the District Director of Internal Revenue in the district where your legal residence is located. However, career personnel, or personnel who have no legal residence, may file their returns with the District Director of Internal Revenue, Baltimore 2, Md.

Personnel with no legal residence who are serving in the below-named areas should file with the district directors listed: 1) In Alaska, with the director at Tacoma, Wash.; 2) Hawaiian Islands, with the director at Honolulu, T. H.; 3) Canal Zone, with the director at Jacksonville, Fla.; 4) Virgin Islands, with the District Director of Internal Revenue, Customhouse Building, New York, N. Y.; and 5) men on duty in Puerto Rico may file with the Director of Internal Revenue, Santurce Building, Santurce, P. R.

• **ACTIVE DUTY AGREEMENTS** —

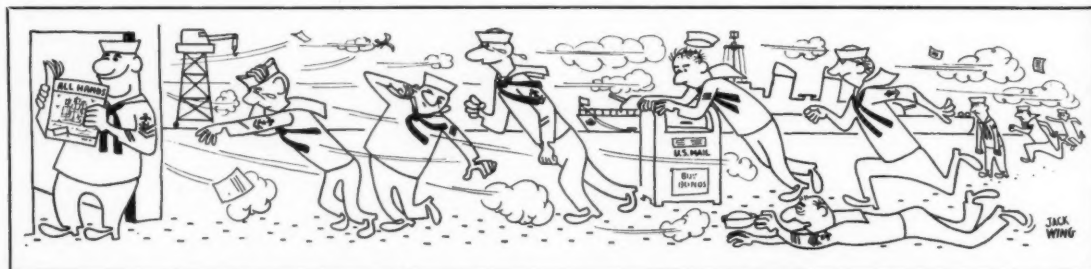
Active duty agreements are now being offered to qualified junior Naval Reserve officers serving on active duty.

If you are interested in being retained on active duty for a period of definite duration, you may apply for an active duty agreement to become effective in fiscal year 1957.

If your active duty agreement expires in fiscal year 1957 but you are not eligible to apply for successive agreements, you will be retained on active duty in indefinite status.

Applications are desired from Reserve officers—except warrant officers—on active duty in the following grades and code categories:

- Male officers of the line, line



PASS THIS COPY ON—Don't let the strong March winds keep this issue from reaching ten men!

V-2" you able chlet on," now filed ernal your ever, who file irect- re 2, ence med t di- with ; 2) irector one, ville, Dis- nue, York, erto or of ling, S - y be- Taval ctive g re- eriod apply o be- 1957. t ex- a are ssive d on a Re- offic- owing line

(aviation), restricted line, Supply Corps and Civil Engineer Corps, in grades up to and including lieutenant, with date of rank of 1 Jul 1953.

- Medical Service Corps, Nurse Corps and Chaplain Corps officers, in grades up to and including lieutenant, with date of rank of 1 Aug 1951.

- Medical and Dental Corps officers in all grades.

Applications should be submitted in letter form to the Chief of Naval Personnel (Attn: Pers B115), Navy Department, Washington 25, D. C., via your commanding officer or reporting senior. You should send in your application four to six months before the date you wish your agreement to become effective.

You may request an agreement of from one to five years in length.

Inactive Reserve officers are not eligible to apply for active duty agreements. However, such officers may apply for active duty under the current voluntary recall program (outlined in BuPers Inst. 1331.4) and later qualify for active duty agreements.

Complete information on the program will be found in BuPers Inst. 1120.22A.

- **KOREAN PUC**—Ships or units which have had trouble establishing their eligibility to the Korean Presidential Unit Citation can get the final word on the subject by addressing an inquiry, with full details, to Chief of Naval Personnel, (Attn: Pers-E3), Washington 25, D.C.

The Bureau has lists of all ships and units which were attached to the Seventh Fleet, Task Force 90, and Task Force 95, and the dates of their attachments and eligibility for the Korean PUC. Since the lists are quite large, publication has been considered inadvisable. As a result the Bureau will handle the requests from ships or units in the field which have had trouble establishing their eligibility.

- **PHONETIC ALPHABET**—The Navy's ABCs have been revised—or, at least, the Navy's phonetic alphabet is no longer the familiar Able, Baker, Charlie. The Navy is promulgating instructions announcing adoption of the phonetic alphabet used by the International Communication Aeronautical Organization. ICAO's "ABCs" are already standard with

civilian airline pilots and are used by the U. S. Air Force in communicating with other than Army and Navy forces. The Alfa, Bravo, Charlie designations also have been adopted by member nations of the North Atlantic Treaty Organization and will be used nationally and internationally in communications—a step made necessary by defense alliances (such as NATO) and training exercises involving personnel who speak a number of different languages.

Here is the new alphabet:

A — Alfa	N — November
B — Bravo	O — Oscar
C — Charlie	P — Papa
D — Delta	Q — Quebec
E — Echo	R — Romeo
F — Foxtrot	S — Sierra
G — Golf	T — Tango
H — Hotel	U — Uniform
I — India	V — Victor
J — Juliett	W — Whiskey
K — Kilo	X — Xray
L — Lima	Y — Yankee
M — Mike	Z — Zulu

Commanding officers are being instructed to institute training in the new alphabet for all personnel who normally use the phonetic alphabet.

- **EXTENSIONS OF ENLISTMENT**—Agreements to extend enlistments of certain Naval Reservists serving on active duty are going to be cancelled before they become effective.

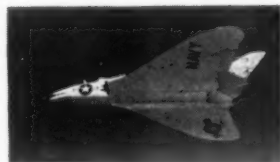
During the period between 19 Jun 1951 and 8 Apr 1953 personnel were being accepted for initial enlistments in the Naval Reserve for periods of four years and minority. They incurred an eight-year service obligation in accordance with the Universal Military Training and Service Act as amended.

Some were permitted to agree to extend their enlistments. Since an agreement to extend a contractual enlistment—by which an individual is already obligated to remain a member of the Naval Reserve—is without effect, such extensions that were permitted to become operative were cancelled and the Reservists pay accounts have been checked for mileage paid.

BuPers Notice 1133, of 10 Nov 1955, directed commands to cancel agreements to extend enlistments of Naval Reservists on active duty in the category described above, but stated that this action did not change or modify any volunteer agreement for active duty.

QUIZ AWEIGH

This issue of ALL HANDS is the naval air force issue so it is only appropriate that we devote this month's quiz to aviation. It isn't too difficult and if you've read the issue through, you should register 4.0. If you have trouble, study this issue carefully.



1. This aircraft is one of the newest in the naval air force. The single seat interceptor-fighter is designated the (a) F4U Corsair (b) F4D Skyray (c) AD 1 Skyraider.

2. This supersonic carrier-based plane has a wing that is described as (a) delta (b) swept back (c) inverted gull wing.



3. You don't see this rating specialty designator too often. It is worn by (a) an air controlman (b) an aerial gunner (c) a journalist radio announcer.

4. This rate was the result of the combination of five wartime ratings. It was established in (a) 1946 (b) 1948 (c) 1950.



5. You'll easily recognize this old time aircraft as an (a) F8F Bearcat (b) SBD Dauntless (c) TBM Avenger.

6. Although this type aircraft is no longer in operation, it performed many missions before being turned out to pasture. When first built, the plane's primary mission was to operate as a carrier-based (a) fighter-interceptor (b) torpedo bomber (c) transport.

YOU'LL FIND THE ANSWERS TO THIS MCNTH'S QUIZ ON PAGE 57.

THE BULLETIN BOARD

For the Family Man: Scholarships Are Open to Navy Juniors

ARE YOUR YOUNGSTERS approaching the age where you must give serious thought to their future schooling? If so, you may be interested to know there are scholarships available exclusively for children of military personnel.

There are scholarships made available by nine groups. They are: The Clausey Medal of Honor, the Navy Wives Clubs of America, the Valley Forge Military Academy, the Daughters of Cincinnati, the Admiral Nicoll Ludlow, the St. Margaret's School for Girls, the Naval Academy Women's Club, the Society of Sponsors of the U. S. Navy, and the La Verne Noyes scholarships. Here's a brief description of each:

- *The Clausey Scholarship* provides for an outright grant to be made each year in an amount not to exceed \$500. This is to be used at or beyond the college level for a child of an officer or an enlisted man of the Navy or Marine Corps who was killed in action or who died as a result of wounds received in actual combat during World War II or the Korean conflict. It was established in memory of the late Lieutenant John Joseph Clausey.

- *The Navy Wives Clubs Scholarship* provides awards to sons and daughters of enlisted men in the first seven pay grades of the Navy, Marine Corps, or Coast Guard, active, retired with pay, or deceased. It is to be used in obtaining college educations, vocational, business or other training which will enable the recipient to make more valuable contributions to society than would otherwise be possible. Each award will be an outright grant of at least \$250 per academic year for the boy or girl selected.

- *The Valley Forge Military Academy* has offered eight scholarships yearly to sons of regular officers of the armed forces having high academic standing, and who are interested in military life. They are awarded for a three-year period in the amount of \$1015 per year, which is about half of the all-inclusive tuition rate.

The applicant must be either a boy between 14 and 16 years of age preparing to enter the tenth grade who will continue on at Valley Forge to receive his secondary school diploma, or a young man preparing to enter the twelfth grade who will receive his secondary school diploma and continue on for two years of junior college to receive a Junior College Associate in Arts diploma from the Academy.

- *The Daughters of the Cincinnati Scholarship* will make awards to daughters of regular Army, Navy or Air Force officers in the amount of \$500 to \$600 per annum, and may be awarded each year until graduation provided the student maintains a high standard of grades and character.

- *The Admiral Nicoll Ludlow Scholarship* was established in 1916 by the Admiral in memory of his son, Nicoll Ludlow, Jr. It provides for two different scholarships. One is for sons of commissioned line officers of the U. S. Navy at St. Paul's School, Concord, N. H., in the amount of \$200 to full tuition of \$1800 according to financial need. Applicants must be between the ages of 12 to 18. The other offers two scholarships for daughters of commissioned line officers of the U. S. Navy at the Emma Willard School, Troy, N. Y. These scholarships vary in amounts but are usually no more than half the room, board, and tuition which is \$2,200

per year. The applicants must be girls between the ages of 13 and 19.

- The Headmistress and Board of Trustees of *St. Margaret's School for Girls* located at Tappahannock, Va., have established an annual tuition scholarship in the amount of \$325 on behalf of an entering freshman at the secondary school level who is the daughter of a member of the Naval service (active, retired or deceased). The requirements include ability to do the work, character and personality which would benefit from studies at this school as well as evidence of need of scholarship assistance.

- The members of the *Naval Academy Women's Club*, Annapolis, Md., have established an annual competitive, tuition scholarship in the amount of \$300 to be used for education on the college level for the daughter of an officer (active, retired, or deceased) of the regular Navy or Marine Corps, with preference being given to the daughter of a deceased man. The award will be made on the basis of scholarship, character and need.

- *The Society of Sponsors of the United States Navy* awards annually to sons of deceased and retired Naval and Marine Corps personnel, one or more scholarships for one academic year to preparatory schools for the United States Naval Academy.

To receive such an award, an applicant for a scholarship must be acceptable to the Scholarship Committee of the Society of Sponsors as to character, aptitude for the naval service, scholastic standing and physical fitness. The financial situation of the applicant's mother, or of the applicant in case his mother is dead, must be such as to warrant the expenditure of the funds of the Society in making such an award.

The number of scholarships to be awarded in any one year will depend upon the state of the Society's Scholarship Fund and the number of acceptable candidates for such scholarships for that particular year.

All-Navy Cartoon Contest—
F. K. McVicker, SK1, USN.



"Are you cleared for secret?"

When, in any one year, the number of acceptable candidates exceeds the number of scholarships available, the awards will be made on a competitive basis, the factors considered being those stated in the paragraph above.

Applications for such scholarships should be made to the Chairman of the Scholarship and Welfare Committee of the Society of Sponsors of the United States Navy, Mrs. W. D. Leggett, 22 North Church Street, Schenectady, New York.

• **La Verne Noyes Scholarships** are awarded only in the universities and colleges listed below.

These scholarships provide for the payment of the tuition, in part or in full, of deserving students needing this assistance to enable them to procure a university or college training. This is done without regard to differences of sex, race, religion, or political party, but only for those who shall be citizens of the United States of America.

Candidates must be blood descendants of a person who served honorably in the U. S. armed forces in World War I.

Eligible students should make application direct to the listed university or college which they wish to attend:

Amherst College	Amherst, Mass.
Beloit College	Beloit, Wis.
Bradley University	Peoria, Ill.
California Institute of Technology	Pasadena, Calif.
Carleton College	Northfield, Minn.
Coe College	Cedar Rapids, Iowa
Cornell College	Mount Vernon, Iowa
Cornell University	Ithaca, N. Y.
Denison University	Granville, Ohio
Grinnell College	Grinnell, Iowa
Howard University	Washington, D. C.
Illinois College	Jacksonville, Ill.
Illinois Wesleyan University	Bloomington, Ill.
Indiana University	Bloomington, Ind.
Iowa State College	Ames, Iowa
Kansas State Agricultural College	Manhattan, Kans.
Knox College	Galesburg, Ill.
Lawrence College	Appleton, Wis.
Michigan State College of Agriculture and Applied Science	E. Lansing, Mich.
Monmouth College	Monmouth, Ill.

All-Navy Cartoon Contest—
W. P. Duensing, HM1, USN.



"Hey, Chief. We got us another volunteer!"

New Mexico College of Agriculture and Mechanic Arts	State College, N. Mex.
North Dakota Agricultural College	Fargo, N. Dak.
Northwestern University	Evanston, Ill.
Oberlin College	Oberlin, Ohio
Oklahoma Agricultural and Mechanical College	Stillwater, Okla.
George Peabody College for Teachers	Nashville, Tenn.
Purdue University	Lafayette, Ind.
South Dakota State College of Agriculture and Mechanic Arts	Brookings, S. Dak.
Southern Methodist University	Dallas, Tex.
State University of Iowa	Iowa City, Iowa
Texas Technological College	Lubbock, Tex.
University of Alabama	University, Ala.
California	Berkeley, Calif.
Chicago	Chicago, Ill.
Colorado	Boulder, Colo.
Illinois	Urbana, Ill.
Kansas	Lawrence, Kans.
Michigan	Ann Arbor, Mich.
Minnesota	Minneapolis, Minn.
Missouri	Columbia, Mo.
Nebraska	Lincoln, Nebr.
North Dakota	Grand Forks, N. Dak.
Oklahoma	Norman, Okla.
Southern California	Los Angeles, Calif.
Texas	Austin, Tex.
Wisconsin	Madison, Wis.
Wabash College	Crawfordsville, Ind.
Washington University	St. Louis, Mo.

In addition, The Board of Trustees of the Mount Vernon Seminary and Junior College, Washington, D. C., will grant a reduction of 10 per cent in the tuition fee for both boarders and day scholars, to daughters of officers and of widows of officers of the regular Navy, Marine Corps, Army, Air Force, and Coast Guard.

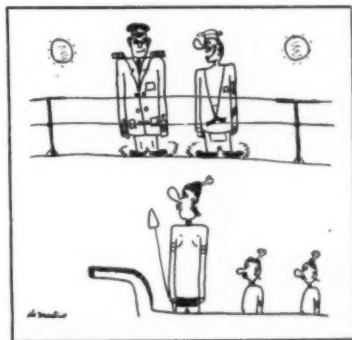
Scholarship selection committees for the Clausey and Navy Wives Scholarships will make selections from high school graduates or above.

Candidates must first be positive that they will be admitted to the schools of their choices, and are advised to apply before 1 April of the year they wish to enter.

Application blanks may be obtained from the Chief of Naval Personnel (Attn: Pers G221). Those applying for the Navy Wives Club Scholarship may also obtain application forms from the secretary of a Navy Wives Club or from Mrs. Genevieve Harris, Secretary of the Scholarship Foundation, whose address is 3407 Meadowbridge Road, Richmond, Va. When requesting application forms, the applicant should specify the scholarship for which he wishes to compete. Application blanks for the Naval Academy Women's Club Scholarship may also be obtained from the Headquarters of Naval District Commandants and from the Secretary of the NAWC. Applications for this scholarship must be submitted no later than 20 March of each year.

Other applications must be in BuPers by 15 April of each year.

All-Navy Cartoon Contest—
A. De Martino, TE1, USN.



"He wants to know if we have any movies to exchange!"

Reservists in Open Rates May Transfer to USN in Same Grades

AS HAS BEEN the practice in the past, Naval Reservists on active duty who are serving in rates considered to be "open" are, if otherwise eligible, permitted to enlist or reenlist in the Regular Navy in their present pay grade if they are recommended by their commanding officer and meet the approval of the Chief of Naval Personnel.

The most recent list of open rates, as promulgated by BuPers Inst. 1130.4C, may be found below. "Open" rates are those in which the number of personnel on board, on a service-wide basis, is sufficiently short of requirements that normal

advancement in rating may not supply the necessary personnel.

Commanding officers are authorized to discharge Naval Reserve personnel serving on active duty for the purpose of immediate enlistment or reenlistment in the Regular Navy either at the normal expiration of enlistment or at any time within three months before expiration of enlistment, or for the convenience of the government.

These are the present open rates for purposes of enlisting or reenlisting in USN:

QM1, QM2, QM3 SOC, SO1, SO2, SO3
RDC, RD1, RD2, RD3 TM2, TM3

GM2, GM3 ME2, ME3
GSC, GS1, GS2, GS3 FP2, FP3
FT1, FT2, FT3 DC2, DC3
MNC, MN1, MN2, PM1, PM2, PM3
MN3 ML2, ML3
ET1, ET2, ET3 SV1, SV2, SV3
IM2, IM3 CE1, CE2, CE3
OM2, OM3 CD3, CM2, CM3
TEC, TE1, TE2, TE3 BU1, BU2, BU3
RMC, RM1, RM2, RM3 SW1, SW2, SW3
CTC, CT1, CT2, CT3 UT1, UT2, UT3
YN2, YN3 AD2, AD3
PN2, PN3 AT1, AT2, AT3
MA2, MA3 AO2, AO3
SK2, SK3 AQC, AQ1, AQ2, AQ3
DK2, DK3 GFC, GF1, GF2, GF3
CS2, CS3 AC2, AC3
SH2, SH3 AB2, AB3
JO1, JO2, JO3 AE1, AE2, AE3
LI2, LI3 AM2, AM3
DMC, DM1, DM2, DM3 PR2, PR3
MU1, MU2, MU3 AG2, AG3
MM1, MM2, MM3 TD2, TD3
EN2, EN3 AK2, AK3
MR1, MR2, MR3 PH2, PH3
BT1, BT2, BT3 HM2, HM3
EM1, EM2, EM3 DT2, DT3
IC1, IC2, IC3

WHAT'S IN A NAME

Sounding Balloon

Balloons are usually thought of as children's toys, especially the gas-filled variety that float away once you let go of the string. However, the Navy has taken the balloon, an oversize version, and has put it to work.

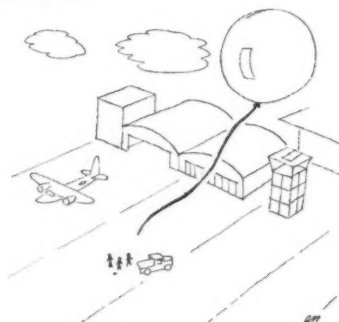
Used for sounding weather conditions, the Navy balloons have made a success of their duty assignment. Weather stations release small 10-gram balloons inflated to ascend at a definite rate. The elapsed time it takes for a balloon to disappear into the lowest layer of clouds is plotted in a mathematical equation. The answer will give the height of the clouds or "ceiling height."

Thus, the "depth" of the sky has been sounded by a method not too different from sounding the depth of the sea with line and lead. There are many ways of sounding the atmosphere, just as there are several more complicated methods of sounding the sea.

One of the more advanced methods of sounding the atmosphere may be accomplished by electronic sounding equipment attached to the balloon itself. This method is called radiosonde. Sonde (rhymes with blonde) is a French word and has the same meaning as the word sounding. Radiosonde equipment is attached to a large plastic balloon such as the Navy's "Skyhook," which is capable of maintaining a constant altitude.

Atmospheric data is gathered by the various instruments while the balloon is in flight — then this information is fed into a self-contained radio transmitter and broadcast back to the weather station. These flights not only provide information on speed and direction of the wind, but also give barometric readings which indicate the position of high and low pressure areas or "fronts."

Recently, radiosonde balloons have been



sent on flights over the Atlantic to collect weather data from this previously inaccessible area. With each new development comes a new word. Sounding the atmosphere over the ocean is called "transosonde."

This system is expected to provide more accurate weather forecasts for ships at sea and carrier-based aircraft. Shore-based naval facilities will also profit from transosonde. Air masses travel in channels or in certain general directions over different areas of the globe. Forecasters will be able to use information from a transosonde balloon drifting over the Pacific to predict weather that will eventually reach our west coast and possibly cross the entire United States.

Further field-evaluation tests are planned for this new system. Balloon flights are scheduled to begin early this year from the big naval installation in Yokosuka, Japan. The Japanese launched incendiary balloons during World War II, some of which reached California. It is expected, therefore, that transosonde will soon sound the atmosphere across the entire Pacific.

An emergency service rate is considered to be related to a general service rate if it is in the same pay grade and its abbreviation is formed by adding a third letter to the abbreviation of the general service rate. The emergency service rates related to QM2, for example, are QMQ2 and QMS2.

If you are not serving in an open rate, but are eligible for enlistment or reenlistment, you may be enlisted in the rate as shown below:

Pay grade in which now serving	Rate in which you may enlist or reenlist in USN
E-7	The pay grade E-6 rate of the related general service rating if pay grade E-6 is listed as open; otherwise pay grade E-5 of the related general service rating.
E-6	The pay grade E-5 rate of the related general service rating.
E-5	The pay grade E-4 rate of the related general service rating.
E-4	The pay grade E-3 rate of the general apprenticeship that forms the path of advancement to the rating held in the Naval Reserve.
E-3, E-2, and E-1	The rate held at time of discharge from the Naval Reserve.

Here are the eligibility requirements:

- You must be serving on active

duty in the naval service, but not on active duty for training. If you are in an open rate, 12 months' of active duty must have been completed within 15 months before enlistment. If not in an open rate, no specific period of active duty is required.

- You must be a citizen of the United States or, if an alien, must present proof of your declaration of intent to become a citizen.

- You must meet the physical standards set forth in BuPers Inst. 1130.3. A request for waiver of slight physical defects may be submitted.

- You must be between 17 and 31 years old at time of enlistment or reenlistment. In order to qualify under the upper age limit, all active duty performed during and after World War II in the Navy or Coast Guard or their Reserve components may be deducted from your age if you have not reached your 40th birthday.

- You may not have more than one dependent if you enlist in pay grades E-1, E-2 or E-3. There is no dependency restriction if you enlist or reenlist in pay grade E-4 or above.

If you first enlisted in the Naval Reserve on or after 10 Aug 1955 and thus acquired an obligation to serve on active duty for two years, you may enlist in the Regular Navy only for a period of six years if your enlistment occurred after recruit training but before completion of 21 months' active duty.

If you first enlisted in the Naval Reserve on or after 10 Aug 1955 and acquired an obligation to serve on active duty for two years and are ordered to active duty at any ship or station directly without having basic recruit training, you may enlist in the Regular Navy only for a period of

All-Navy Cartoon Contest—
B. L. Peeples, AM1, USN.



"No, you're not late for muster! It's Sunday."

six years if your enlistment occurs before you complete 21 months' active duty.

If you are a Naval Reservist on active duty and are not included in the two categories immediately above, you are authorized to enlist or reenlist in the Regular Navy for four or six years.

List of New Motion Pictures Ready for Distribution To Ships and Overseas Bases

The latest list of 16-mm. feature motion pictures available from the Navy Motion Picture Service, Bldg. 311, Naval Base, Brooklyn 1, N.Y., is published here for the convenience of ships and overseas bases. The title of each movie is followed by the program number. Films in color are designated by (C). Distribution of these films began in January.

Films distributed under the Fleet Motion Picture Plan are leased from the motion picture industry and are distributed free to ships and most overseas activities. Films leased under this plan are paid for by the BuPers Central Recreation Fund (derived from non-appropriated funds out of profits by Navy Exchanges and ship's stores) supplemented by annually appropriated funds. The Chief of Naval Personnel administers this program.

The Scarlet Coat (435) (C): Historical Drama; Cornel Wilde, Anne Francis, Michael Wilding.

The Vanishing American (436): Western; Scott Brady, Audrey Totter.

The Return of Jack Slade (437): Western; John Ericson, Mari Blanchard.

The Dolly Sisters (438) (C) (Re-issue): Musical; Betty Grable, John Payne, June Haver.

The Queen Bee (439): Drama; Joan Crawford, Barry Sullivan, John Ireland.

The Desperate Hours (440): Drama; Humphrey Bogart, Fredric March, Arthur Kennedy, Martha Scott, Dewey Martin, Gig Young.

Tarantula (441): Science-Fiction Drama; John Agar, Mara Corday.

The Crooked Web (442): Drama; Frank Lovejoy, Mari Blanchard, Richard Denning.

The Cobweb (443) (C): Psychiatric Drama; Richard Widmark, Lauren Bacall, Charles Boyer, Gloria Grahame.

The Big Knife (444): Drama; Jack Palance, Ida Lupino, Wendell Corey, Shelly Winters.

Top Gun (445): Western; Sterling Hayden, Karen Booth.

Toughest Man Alive (446): Melodrama; Dane Clark, Lita Milan.

No Man's Woman (447): Drama; Marie Windsor, John Archer.

The Man With The Gun (448): Drama; Robert Mitchum, Jan Sterling.

Love Me Or Leave Me (449) (C): Musical Biography, Doris Day, James Cagney, Cameron Mitchell.

Jupiter's Darling (450) (C) (Re-issue): Musical; Esther Williams, Howard Keel.

Lucy Gallant (451) (C): Drama; Jane Wyman, Charlton Heston, Thelma Ritter, Claire Trevor.

The Green Buddha (452): Melodrama; Wayne Morris, Mary Germaine.

Desert Sands (453) (C): Foreign Legion Story; Ralph Meeker, Marla English.

Bobby Ware Is Missing (454): Kidnap Melodrama; Arthur Franz, Neville Brand.

Bedevelled (455) (C): Melodrama; Anne Baxter, Steve Forrest.

We're No Angels (456) (C): Comedy; Humphrey Bogart, Aldo Ray, Peter Ustinov, Joan Bennett.

A Man Alone (457) (C): Western; Ray Milland, Mary Murphy, Ward Bond.

The King's Thief (458) (C): Historical Adventure Drama; Ann Blyth, Edmund Purdom, David Niven.

All-Navy Comic Cartoon Contest—
C. W. Zuber, Jr., AO3, USN



"My Mother says . . . and if the boy down the street can make sergeant, why can't you?"

Where to Look for Latest Information on Career Opportunities

HERE'S AN UP-TO-DATE list of the directives dealing with career opportunities and programs available to Navy enlisted personnel and officers, classified according to subject.

In the April 1955 issue of ALL HANDS were listed the basic Navy publications which would help you answer many of the questions concerning your career.

However, in normal day-to-day naval operations there is a continuing flow of information on your Navy career, service advantages, opportunities and benefits. This information appears in a variety of forms—in manuals, handbooks, regulations, pamphlets, catalogs, instructions and notices.

Although most of this material is

generally available to all ships and stations, it's frequently difficult to locate once published, changes are frequently made and at irregular intervals and, at times, some information is unintentionally overlooked.

So here's your most recent check-off list, which supersedes that presented on page 50 of the July 1955 issue of ALL HANDS:

Subject	Pertinent Directive or Authority	Subject	Pertinent Directive or Authority
ADVANCEMENT OR CHANGE IN RATE OR RATING			
GENERAL PROGRAMS			
Advancement in rate/rating:		Appointment to Commissioned Grade of Enlisted Women in the U. S. Naval Reserve; policy, eligibility	BuPers Inst. 1120.9A
Policy:	BuPers Inst. 1430.7A; BuPers Manual (Pt. C, chap. 7, sec. 2)	Appointment in the Field of Sciences of Personnel in the Medical Service Corps, Naval Reserve; policy, eligibility	BuPers Inst. 1120.24
Qualifications:	Manual of Qualifications for Advancement in Rating (NavPers 18068)	Nomination of Qualified Enlisted Personnel for NROTC Program; policy, eligibility	BuPers Inst. 1111.4B
Eligibility:	BuPers Inst. 1414.2A	TRAINING	
Naval Reserve	*BuPers Inst. 1430.1A	GENERAL TRAINING	
Servicewide Competitive Examinations for Advancement to Pay Grade E-4, E-5, E-6, and E-7; policy, eligibility	BuPers Inst. 1418.7B	Enlisted Training Schools and Courses; policy quotas, eligibility for enrollment	*BuPers Inst. 1500.-25A, Catalog of the U. S. Navy Training Activities and Courses (NavPers 91769-B)
Changes in Rate, Rating, and Rate Symbols; policy	BuPers Inst. 1440.5A	Information and Education Program; policy	BuPers Inst. 1560.1, Art. D-2103, BuPers Manual Information and Education Manual (NavPers 16963-C)
SPECIAL PROGRAMS		Enlisted Correspondence Course Program	Catalog of Enlisted Correspondence Courses (NavPers 91200-A)
Advancement in Rating; Personnel under Instruction in Service Schools	BuPers Inst. 1430.5A	SPECIALIZED TRAINING	
Change of Rating to ET, FT, AT, AQ and GF; policy, eligibility	BuPers Inst. 1440.12, BuPers Inst. 1440.-13, BuPers Inst. 1440.14	Naval Air Mobile Trainer Program; policy, eligibility	*BuPers Inst. 1306.31A
APPOINTMENT TO COMMISSIONED GRADE		Training Program for Change in Rating to ET, FT, AT, AQ, GF, AND GS; policy, eligibility	BuPers Inst. 1440.12, BuPers Inst. 1440.-13, BuPers Inst. 1440.14
NAVAL ACADEMY, FLIGHT TRAINING, OCS		U. S. Naval School of Music, applications for courses	BuPers Inst. 1336.2A
Naval Preparatory School Training; policy, eligibility	Art. C-1203, BuPers Manual, BuPers Inst. 1531.2	REENLISTMENT	
Aviation Cadet Training Program; eligibility requirements; procedures for applying	BuPers Inst. 1120.20A	Reenlistment and Voluntary Extension of Regular and Reserve Personnel on Active Duty; procedure	BuPers Inst. 1133.1B, Art. A-4203 and Art. A-4204, BuPers Manual
Appointment to Commissioned Grade, Regular Navy; policy, eligibility	BuPers Inst. 1120.7B	Reenlistment in the Regular Navy or Voluntary Retention on Active Duty of Inducted Personnel; policy, eligibility	BuPers Inst. 1133.8
Appointment to Commissioned Grade, LDO, Regular Navy; policy, eligibility	BuPers Inst. 1120.18B	Discharge Up to One Year in Advance of Normal Expiration of Enlistment Date in Order to Reenlist; policy, eligibility	BuPers Inst. 1133.4
Officer Candidate School; policy, eligibility	BuPers Inst. 1120.11A	Reenlistment in the Regular Navy of Reserve Personnel Serving on Active Duty; Policy, eligibility	BuPers Inst. 1130.4C
SPECIAL PROGRAMS		Assignment to Duty of Personnel on Reenlistment; policy options, choice of duty, etc.	BuPers Inst. 1306.25B
Regular Navy Augmentation Program; policy, eligibility	BuPers Inst. 1120.12D	Assignment to a School as an Incentive for Reenlistment; policy, eligibility	BuPers Inst. 1133.5
Appointment to Commissioned Grade, SDO (LAW), 1620; policy eligibility	BuPers Inst. 1120.21		
Appointment to Commissioned Grade, Optometry, Pharmacy, and Medical Allied Sciences Sections of the Medical Corps, Regular Navy; policy, eligibility	BuPers Inst. 1120.8A		
Appointment to Commissioned Grade in Administration and Supply Sections, Medical Service Corps, Regular Navy; policy, eligibility	BuPers Inst. 1120.15A		
Appointment to Commissioned Grade in Administration and Supply Sections, Medical Service Corps Reserve, U. S. Naval Reserve; policy, eligibility	BuPers Inst. 1120.10A		

Subject	Pertinent Directive or Authority
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SPECIAL DUTY AND ASSIGNMENT

GENERAL POLICY

Requests for Change of Duty; policy	Art. C-5203, BuPers Manual
Sea/Shore Rotation; shore duty eligibility list; policy	BuPers Inst. 1306.20B
Training and Administration of the Naval Reserve; duty in; policy, eligibility	*BuPers Inst. 1001.7A
Retention on Active Duty and Recall of Enlisted Naval Reserve and Fleet Reserve Personnel; information concerning	BuPers Inst. 1001.21
Assignment of Enlisted Personnel to the Nuclear Power Training Program; policy, eligibility	BuPers Inst. 1306.53
Assignment and Rotation of Enlisted Women; policy	BuPers Inst. 1306.10B

SPECIAL ASSIGNMENTS

Transfer and Assignment for Humanitarian or Hardship Reasons; policy, eligibility	BuPers Inst. 1306.24A
Assignment of More Than One Member of Same Immediate Family to Same Unit; policy	Art. C-5209, BuPers Manual, BuPers Inst. 1306.33
Assignment to Duty of Sole Remaining Sons; policy	BuPers Inst. 1300.11
Assignment to Naval Missions, Attaches, Military Aid Groups, Joint Staffs, SHAPE; policy, eligibility	BuPers Inst. 1306.6A
Assignment to Recruiting Duty; policy, eligibility	Art. C-5208, BuPers Manual
Assignment to Duty as Instructors; policy, eligibility	BuPers Inst. 1336.1A BuPers Inst. 1306.22B *BuPers Inst. 1306.42 (applies to musicians only)
Assignment with Naval Security Group Activities; policy, eligibility	BuPers Inst. 1306.23B
Assignment to Nuclear Power Program; policy, eligibility	SecNav Inst. 1000.3
Assignment to Submarine Duty; policy, eligibility	BuPers Inst. 1540.2A
Assignment to Reserve Training Submarines; policy, eligibility	*BuPers Inst. 1306.38
Assignment to Duty Involving Demolition of Explosives; policy, eligibility	BuPers Inst. 1320.5A

PAY, ALLOWANCES, SAVINGS, INSURANCE

Soldiers' and Sailors' Civil Relief Act of 1940; summary of benefits under	BuPers Inst. 1760.4
Uniformed Services Contingency Option Act; options under	BuPers Inst. 1750.1A
Social-Security Benefits Due to Active Duty; summary of benefits under	BuPers Inst. 1760.8
Basic Allowances for Quarters; Policy, eligibility	BuPers Inst. 7220.12
Savings Deposits of Enlisted Personnel; policy	SecNav Inst. 7220.9
Retainer Pay Upon Transfer to the Fleet Reserve; policy, eligibility	Art. C-10321, BuPers Manual
Mortgage Insurance for Servicemen to Aid in the Construction or Purchase of Homes; policy, eligibility	SecNav Inst. 1741.4

SEPARATION AND RETIREMENT

Separation and Civil Readjustment Information; summary	BuPers Inst. 1760.12
Review of Undesirable and Punitive Discharges; information concerning	BuPers Inst. 1626.16
Early Separation of Enlisted Personnel to Attend College	BuPers Inst. 1910.12

Subject	Pertinent Directive or Authority
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Retirement, Voluntary and Naval Reserve with Pay; policy, eligibility

BuPers Inst. 1820.1,
BuPers Inst. 1820.2,
SecNav Inst.
1811.3A

MISCELLANEOUS

GENERAL INTEREST

The Navy Relief Society; services by	Art. C-9207, BuPers Manual BuPers Inst. 1747.1A
The American Red Cross; services by	Art. C-9207 and Art. C-10308(7), BuPers Manual
Voting By Members of the Armed Forces; policy	BuPers Inst. 1742.2
Immigration and Nationality Act of 1952; alien spouses, naval personnel, information concerning	SecNav Inst. 1750.1
VA Hospitals; transfer of Naval active and retired personnel to; policy	*BuMed Inst. 6320.11
Marriage of USN and USMC Personnel Outside the United States and Within Far East Command; policy	SecNav Inst. 1752.1 SecNav Inst. 1752.2
Visas For Alien Wives and Children of Naval Personnel	*SecNav Inst. 1750.2
Participation of Enlisted Personnel in Inter-Service and International Athletic Events and Competitions; policy, eligibility	BuPers Inst. 1710.1B, BuPers Inst. 1710.2
Transportation of Dependents; policy	BuPer Inst. 4650.6A, BuPers Inst. 4650.8, SecNav Inst. 4651.1
Summary of State Bonuses	BuPers Inst. 1760.3

PROGRAMS AND OPPORTUNITIES OF PARTICULAR INTEREST TO OFFICERS

TRAINING

GENERAL TRAINING

Schools and Courses	Catalog of U. S. Navy Activities and Courses (NavPers 91769-B)
	*BuPers Inst. 1500.25A
General Line School; policy, eligibility	BuPers Inst. 1520.13 BuPers Inst. 1520.43 BuPers Inst. 1520.15B BuPers Inst. 1520.37
Postgraduate Instruction; policy, eligibility	
Five-Year Term College Training Program; policy, eligibility	BuPers Inst. 1520.38
Completion Naval Aviation College Program for USN Officers; policy, eligibility	
Officer Correspondence Courses; summary	Catalog of Officer Correspondence Courses (NavPers 10800-A)

SPECIALIZED TRAINING

Flight Training (HTA); policy, eligibility	BuPers Inst. 1520.20
Underwater Demolition Training; policy, eligibility	BuPers Inst. 1520.7
Deep Sea Diving Training; policy, eligibility	BuPers Inst. 1520.4A
Training and Administration of the Naval Reserve; policy	BuPers Inst. 1001.10A

ASSIGNMENT TO SPECIAL DUTY

Assignment to Submarine Duty; policy, eligibility	BuPers Inst. 1520.6F
Assignment to Special Weapons Program; policy, eligibility	BuPers Inst. 1331.1A
Assignment With a Navy Security Group; policy, eligibility	BuPers Inst. 1331.2A

THE BULLETIN BOARD

Subject	Pertinent Directive or Authority	Subject	Pertinent Directive or Authority
Assignment to Duty Involving Demolition of Explosives; policy, eligibility	BuPers Inst. 1320.5A	Appointment of Naval Reserve Medical and Dental Corps Officers to Commissioned Grades in the Regular Navy; policy, eligibility	BuPers Inst. 1120.3C
Assignment to Nuclear Power Program; policy, eligibility	SecNav Inst. 1000.3	Appointment to Commissioned Grades, Regular Navy policy, eligibility	BuPers Inst. 1120.7B
Transfer of Officers Line-Aviation to Line; policy, eligibility	BuPers Inst. 1210.7		
APPOINTMENT		MISCELLANEOUS	
Appointment to Ensign Limited Duty Officer; policy, eligibility	BuPers Inst. 1120.18B	Uniform Allowances for Naval Reserve Officers; entitlement and reimbursement for	BuPers Inst. 7220.14
Appointment of Naval Reserve Aviators to Commissioned Grades in Regular Navy; policy, eligibility	BuPers Inst. 1120.14A		

*Note: The asterisk indicates limited distribution to commands concerned.

Revised Correspondence Course For Navy Chaplains Available

The officer correspondence course, *The Navy Chaplain*, has been completely revised and is now available at the Naval Correspondence Course Center. This course consists of nine assignments, and is evaluated at 18 Naval Reserve promotion and retirement points. Personnel who completed the earlier course, NavPers 10905, will receive additional credit for completing the revision, NavPers 10905-A.

Applications for enrollment should be submitted on form NavPers 992 to the Naval Correspondence Course Center, Building RF, U. S. Naval Base, Brooklyn 1, New York.

Freight Transportation and Traffic Management Course

Supply Corps officers have until 2 Apr 1956 to submit their applications for the next session of the Freight Transportation and Traffic Management Course at the U.S. Naval School Freight Transportation, Naval Supply Center, Oakland, Calif.

The course is designed to train officers for assignment to operating, technical or management billets in freight traffic management and terminal management.

Every phase of freight or cargo movement from source of supply through tidewater terminals to the ultimate consumer is covered during the course. The instruction during the nine-month course employs lectures, conferences, practical problems, tours and actual "on the job" observation and training with the last three months of the course devoted to the advanced study of freight traffic management.

Supply Corps officers, LTJG

through LCDR, are eligible for the course and will be enrolled for nine months. Officers selected for the training are ordered on a permanent change-of-duty basis and are normally due for a tour of shore duty upon commencing the course.

A number of line officers will also be selected to attend the course but this will be done through administrative action in the Bureau of Naval Personnel.

Navy Hospital Patients Have Duty Option on Reenlisting

Navy men who reenlist while patients in Navy hospitals may now select a duty assignment option on the same basis as those reenlisting elsewhere. Selections of options are to be made upon release from hospitalization.

Since 1950, personnel whose enlistments expired while patients in Navy hospitals have been authorized to reenlist in the Navy, provided it was anticipated that they would be physically and otherwise

qualified for full duty. BuPers Inst. 1133.9, continues this authorization and extends to hospital patient reenlistees the duty assignment options granted to others last March and September.

Commanding officers of U. S. naval hospitals and the Naval Medical Unit, Tripler Army Hospital, have been directed to state on report of physical examination for reenlistment that the member is a patient in a naval hospital or naval medical unit, and that the defect or condition for which the person is under treatment would be unlikely to hinder his performance on return to full duty.

Correspondence Course Covers X-Ray Physics and Technique

Part of the suspended Medical Department correspondence course in Special Clinical Services (General) has now been re-issued as a four-assignment course entitled *X-Ray Physics and Technique* (NavPers 10702). This course covers the theory of X-rays, the operations of X-ray machines, and practical applications of radiographic technique to various medical problems.

The course is evaluated at 12 retirement and promotion points. It is recommended for both officer and enlisted personnel of the Medical Department. Those who completed the earlier course in Special Clinical Services (General) will not receive additional credit for this course.

Application for enrollment should be submitted on Form NavPers 992 (Rev 10-54) (with appropriate change in the "To" line) forwarded via official channels to the Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda, Md.

All-Navy Cartoon Contest— J. F. McNeil, ETI, USN



"Still, you can't help admiring the persistence of these college men."

Safety Program Organized To Help Prevent Accidents

A safety program for off-duty Navy personnel has been organized throughout the Navy to help prevent accidents arising out of the operation of privately owned motor vehicles.

The Secretary of the Navy has directed that a motor vehicle accident prevention program be established in the Navy under the joint responsibility of the Chief of Naval Personnel and the Commandant of the Marine Corps.

While the idea for a safe driving program is not new, and there are already several safety programs in effect throughout the Navy, the Navy Traffic Safety Program will coordinate all safe driving programs on a Navy-wide basis. In this way safe driving methods that have already been successful at some activities will be available to all commands.

Commanding officers have been requested to include in their training programs a provision for instruction in safe driving directed toward developing better driving habits. To assist in this instruction the pamphlets *Safety in Driving* (NavPers 10888) and *Safety in Driving Charts* (NavPers 70131) are being distributed.

In addition, motion pictures showing accidents, traffic violations and safe driving practices are being used for instruction.

District commandants, Fleet and type commanders are responsible for the effective operation of training Program is outlined in BuPers Inst. under their command. Additional information on the Navy Traffic Safety Program is outlined in BuPers Inst. 5101.2.

Enlisted Correspondence Course Available for CD Ratings

A new Enlisted Correspondence Course, *Driver 3* (NavPers 91573-1), is now available to all enlisted personnel on active or inactive duty.

This course carries 18 retirement points and is applicable to Navymen with the rate of CD.

Application for enrollment should be made on NavPers Form 580 forwarded via official channels to the Naval Correspondence Course Center, Building RF, U. S. Naval Base, Brooklyn 1, N. Y.

WAY BACK WHEN

Navy's First Hawaiian Flight

Today, Navymen and their families casually board giant Mars flying boats at San Francisco and, 12 hours later, disembark at Hawaii. The trip is safe, comfortable and rapid.

The passengers' needs are attended by orderlies, meals are served; and if they feel like taking a nap, they recline in foam rubber seats.

It wasn't like that in the old days. It was only a little more than 30 years ago (10 Sep 1925, to be exact) that five Navy fliers in one disheveled seaplane completed the first crossing between California and Hawaii.

They made it the hard way. Though most of the trip was by air, a substantial part was sailed. The last leg was made under tow, first by a submarine (which managed to go aground in the process) and finally at the end of a line attached to a rowboat.

It was on 31 Aug 1925 that a Navy PN-9 patrol bomber, a metal-hulled twin-engined biplane flying boat headed west out of San Francisco, bound for Honolulu. On board were CDR John Rodgers (skipper and navigator); LT B. J. Connell (pilot); S. R. Pope, AP, (co-pilot); O. G. Stanz, CRM, (radioman); and W. M. Bowlin, AMM 1/C, (flight engineer).

Also aboard were 1350 gallons of gasoline, stored in the plane's tanks and in five-gallon cans tucked away wherever there was storage space. To fuel the fliers there was a six-pound can of corned beef, 40 ham sandwiches, a supply of hardtack, five gallons of water, two dozen oranges, and odds and ends such as coffee and soup. Included among the stores was a small still, thoughtfully presented to CDR Rodgers by his mother as a going-away gift.

Spaced at about 200-mile intervals along the projected route were 10 ships. One of these, USS Aroostook (CM 3), carried spare fuel in case—perish the thought—the plane were to run dry along the way.

In spite of all precautions, PN-9 missed connections with Aroostook. After 25½ hours' flying time had drained the gas tanks and tin cans, the seaplane landed safely on the water about 200 miles from Hawaii and approximately 1900 miles from San Francisco.

All hands stood by for the rescue. It did not come for nine days. With their radio transmitting set out of commission because they had no fuel to operate the generator, they were unable to send out messages giving their position.

As soon as it was realized that the plane was down at sea, all ships in the vicinity began their search. In addition, a squadron



of destroyers, homeward bound from an Australia-New Zealand cruise was pressed into service.

Although the transmitter was inoperative, men on board the PN-9 were able to make the receiver work and thus were able to listen to reports of the ships searching for them. They were able to plot the positions of the searchers and soon realized there was no immediate hope of rescue.

Since aid could not be expected, the rugged fliers decided to rescue themselves. Ripping fabric from the lower wing panels, they improvised sails between the upper and lower wings and thus were able to log up to 50 miles travel a day. Once during their voyage a ship passed within five miles, but failed to see the windjamming seaplane.

Although PN-9 sailed within 60 miles of Oahu (the crew saw searchlights at night, and Army planes during the day), the prevailing winds made it necessary to head for the island of Kauai, lying to the northwest. By 10 September CDR Rodgers and his crew had brought the plane to within 15 miles of Nawiliwili Bay, Kauai. At nightfall they improvised a sea anchor, and planned to wait for sunrise before sailing handily into the harbor.

Using wood from the plane's wing spars, they set a signal fire inside a bucket during the darkness, and were sighted by the submarine R-4. Although it picked them up and started the two to Nawiliwili Harbor, the plane's adventures were not yet over. On the way the sub went aground. To free itself, it was necessary to cast loose the PN-9. A rowboat finally hauled the plane into port, nine days overdue.

CDR Rodgers earned his wings in 1913 and was designated Naval Aviator No. 2. USS John Rodgers (DD 574) was named jointly in his honor, as well as for two other Navymen, Commodore John Rogers (of the War of 1812) and Rear Admiral John Rodgers (Civil War).

There's Still Time to Apply as a Candidate in the Olympics

SINCE 1956 is the year of the XVI Olympiad, the All-Navy and Inter-Service sports programs are scheduled for double duty. Besides providing for recreation and entertainment and promoting understanding and goodwill between the men in the different branches of the armed forces, the sports program will provide an elimination process for potential Olympic athletes in certain sports.

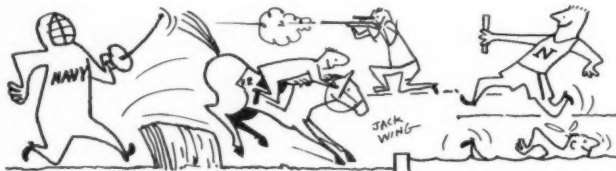
The All-Navy and Inter-Service sports calendar for 1956 lists the championships scheduled in seven individual and four team sports. Championships that will reach the Inter-Service level of competition are basketball, boxing, golf, swimming and diving, track and field, and tennis.

All-Navy championships will be conducted in boxing, swimming and diving, wrestling, track and field, tennis, and golf. Sports which will only go to the All-Navy Eastern and All-Navy Western level include baseball, bowling, softball and basketball.

Basketball, although not listed on the All-Navy level of competition, is one sport which has been added to the Inter-Service sports schedule because of the Olympics. Outstanding

individuals from the All-Navy Eastern and All-Navy Western tournaments, plus outstanding men who have submitted requests and have been selected for training, will make up the Navy squad that will play in the Inter-Service tourney.

The round-robin Inter-Service basketball tournament, slated for the



latter part of this month in Louisville, Ky., will serve as the preliminary try-outs for the Olympics. The team winning this championship will be used as the nucleus for the armed forces Olympic basketball squad. Certain outstanding players from the other three teams will also be selected. The armed forces Olympic basketball squad will then compete in a tournament against the AAU and collegiate champions to determine the U. S. team to go to the Olympic Games.

Any Navy athlete, regardless of his sport, who thinks he is a potential world's champion, should make haste in submitting his request to the Bureau of Naval Personnel for con-

sideration for training. Although time is running out, you may still submit your application in accordance with BuPers Inst. 1710.2.

Competition for women has also been scheduled under this year's sports program. Waves and Nurses are eligible to compete in the individual sports of bowling, golf, and tennis. Team sports will be conducted for women in basketball, bowling, and softball. Women's sports tournaments, which reach only to the Eastern and Western All-Navy level of competition, will be

held at the same time, but separate from the men's championships.

Rules for the conduct of the various sports tournaments are about the same as last year. One big change is in baseball and basketball, where a double elimination type tournament will be held in each of these sports. Before, these sports used to be a sudden death tournament.

Boxing remains the same, with competition slated for the ten weights prescribed by the AAU and the mandatory wearing of head guards. The Bureau will specifically designate those boxing competitions (leading directly to the Olympics) in which the wearing of head guards will be waived. In all other boxing competitions headguards must be worn.

All bowling championships will be determined in five-game matches. In the team event, the title will be decided by the five highest scores rolled by the six-man team.

There will be both Open and Senior divisions in golf. The Open division will consist of 72-holes of medal play while the Senior division will be 54-holes of medal play. A Senior may elect his division but may compete in one division only. The Senior division is open only to Navymen who have reached their 45th birthday. Competition in the women's division of golf will consist of 54-holes of medal play.

Swimming and diving has been elevated to the All-Navy level of competition this year with 11 events scheduled. There are no limits on the number of events a man may

Zoo Race Nets Funds for Olympics

"Sailors Run in Zoo Race" is the headline one San Diego newspaper used in telling of the unusual method USS *Mount McKinley* (AGC 7) sailors used to raise funds for the U. S. Olympic Team. According to the BuPers Notice which announced the drive, Olympic fund donations could be collected voluntarily by any methods deemed practicable — so *McKinley's* skipper came up with an idea for a mock relay race to be run for the entertainment of Sunday crowds at San Diego's zoo.

Four booths for combined relay station-donation duty were set up. Each station was "manned" by a local beauty queen escorted by an ensign who acted as

"barker," and an enlisted man who kept a record of donations on a 10-foot "thermometer." Huge Olympic Association shields, *Mount McKinley* life rings and seven-foot silhouettes of a discus thrower completed the decoration.

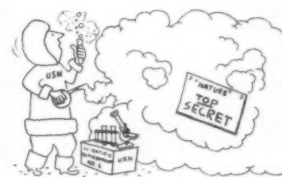
Runners were recruited from among AGC 7's experienced athletes; "Li'l Mo" Connolly of national tennis fame was recruited to start the first relay, and *McKinley* men were off on their mock version of the 2750-mile, 15-day marathon which will open the 1956 Olympic Games. The unusual idea's success was reflected in the check forwarded for use by the Olympic Team.

HERE'S YOUR NAVY

With the eyes of the rest of the Navy on them, figuratively speaking, the men and ships of Task Force 43 are now deep in the Antarctic. Their mission is to establish bases and to take preliminary steps which will help reveal the mysteries of the great land mass of snow and ice.

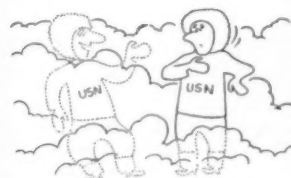
While there, Navymen will encounter a strange phenomenon known as the "whiteout." Called by some the "white darkness," it is easily recognized—by nothing.

Day after day, nothing can be seen but a whitish haze. There are no sha-



dows, nor is there any definition between black and white. There is no horizon. Moving objects disappear before the spectator's eyes and a man standing alongside you suddenly vanishes into thin air. At times, you can't see the snow on which you are walking.

Sledge and tractor drivers may not be able to move for days at a time until shadows reappear by which they can detect the parallel ridges which indicate the presence of crevasses. Otherwise, they might stumble blindly into an area crisscrossed with the rifts, sometimes reaching a depth



of 1000 feet, which may be death traps for the polar explorers.

No one has yet been able to give an acceptable explanation of the Antarctic whiteouts, and they will continue to be one of the biggest dangers faced by members of the Task Force during their stay on the earth's southernmost outpost.

It will also be one of the many mysteries that meteorologists will attempt to explain during their stay. Until they reach a satisfactory explanation, it will remain classified as one of Nature's impenetrable secrets — consisting of nothing.

enter or on the number of individuals who may enter one event. However, competitors should be able to equal or better the standards in the different swimming events as published in BuPers Notice 1710 of 20 Dec 1955.

The same holds true in the track and field events, where established standards must be met or surpassed in order that a man be eligible to compete. There are no limits to the number of events an athlete may enter, nor is there a limit on the number of individuals who may enter any one event.

Both the men's and women's tournaments in softball will be double elimination affairs, conducted in accordance with the current Amateur Softball Association rules.

Tennis will be governed by the current USLTA rules and will be a single elimination tournament. Tennis, like golf, will have both an Open and Senior division. Men who have reached their 40th birthday are eligible to compete in the Senior division.

Here's the schedule of this year's Inter-Service and All-Navy sports events: (Asterisk indicates competition to be held for both men and women)

Other important administrative items, such as eligibility, transportation of team and individuals, finances, coaches, and augmentation, are covered in BuPers Inst. 1710.1C. Paragraph 13 of this instruction covers the publicity angle. ALL HANDS is highly interested in running the results and action pictures of the various tournaments.

Railway Furlough Rates Continue for Servicemen

You may continue to enjoy furlough fares, good for travel within the continental limits of the United States while in a leave status, until 1 Jan 1957.

The passenger-carrying railroads have agreed to continue to grant reduced round trip coach fares to all active military personnel, including cadets and midshipmen, traveling in uniform, while on written authority for leave, pass, or furlough, including liberty cards but not ID cards.

Tickets will be over the same route in both directions, good for 90 days from date of sale, and will include regular stopover and baggage privileges. Such tickets sold to U. S. military personnel will be tax-exempt. Tax exemption will not apply to tickets sold to foreign military students.

Inter-Service and All-Navy Sports Schedule

EASTERN AND WESTERN ALL-NAVY			ALL-NAVY	INTER-SERVICE
SPORT	DATE	HOST	DATE-SITE	DATE-SITE
BOXING	9 Apr	ComOne ComEleven	16 Apr, Newport, R.I.	1st week in Oct, Camp Lejeune, N.C.
*GOLF	6 Aug	ComSix ComEleven	13 Aug, ComFive	Last week in Aug, Eglin AFB, Fla.
SWIMMING AND DIVING	NONE		16 Jul, San Diego	7-9 Aug, San Diego
TRACK AND FIELD	NONE		21 May, San Diego	19 Jun, Los Angeles (Army is host)
*TENNIS	6 Aug	ComOne ComEleven	13 Aug, Newport, R.I.	Last week in Aug, Site to be determined (Air Force is host)
WRESTLING	12 Mar	ComFive ComEleven	19 Mar, ComFive	NONE
*BASKETBALL	5 Mar	CinClantFlt ComEleven	NONE	22-24 Mar, Louisville, Ky.
BASEBALL	10 Sep	ComFive ComTwelve	NONE	NONE
*BOWLING	12 Mar	ComFour ComThirteen	NONE	NONE
*SOFTBALL	3 Sep	ComThree ComEleven	NONE	NONE

Latest List of Ships and Service Craft by Type and Designator

Granted you have no trouble identifying your own ship, whether by silhouette, hull number or wheeze in the number three cylinder, but how about other ships of the Fleet? Who, or what, for example, is YFRN 412? And is an AB the same thing as an AW?

There have been many changes made in ships' designations since the list of ships and service craft by type and designator was published in the April 1955 issue of ALL HANDS. To bring you up to date, here's the most recent list available:

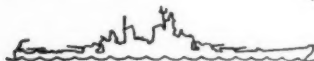
Combatant

• Warships

- BB—Battleship
- BBG—Guided Missile Capital Ship



- CA—Heavy Cruiser
- CAG—Guided Missile Heavy Cruiser
- CB—Large Cruiser
- CL—Light Cruiser
- CLAA—Antiaircraft Light Cruiser
- CLG—Guided Missile Light Cruiser
- CBC—Large Tactical Command Ship
- CLC—Tactical Command Ship
- CVA—Attack Aircraft Carrier
- CVE—Escort Aircraft Carrier
- CVHE—Escort Helicopter Aircraft Carrier
- CVL—Small Aircraft Carrier
- CVS—ASW Support Aircraft Carrier
- DD—Destroyer
- DDC—Corvette
- DDE—Escort Destroyer
- DDG—Guided Missile Destroyer
- DDR—Radar Picket Destroyer
- DL—Frigate



- DLG—Guided Missile Frigate
- SS—Submarine
- SSG—Guided Missile Submarine
- SSK—Anti-Submarine Submarine
- SSN—Nuclear Power Submarine
- SSR—Radar Picket Submarine
- Amphibious Warfare Vessels
- AGC—Amphibious Force Flagship
- AKA—Attack Cargo Ship
- APA—Attack Transport
- APD—High Speed Transport
- ASSA—Cargo Submarine
- ASSP—Transport Submarine
- CVHA—Assault Helicopter Aircraft Carrier
- DEC—Control Escort Vessel
- IFS—Inshore Fire Support Ship
- LSSL—Support Landing Ship (Large) Mk. III
- LSD—Dock Landing Ship
- LSM—Medium Landing Ship



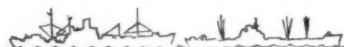
- LSMR—Medium Landing Ship (Rocket)
- LST—Tank Landing Ship
- LSV—Vehicle Landing Ship
- LSFF—Flotilla Flagship Landing Ship
- LSIL—Infantry Landing Ship (Large)
- LPH—Amphibious Assault Ship

• Mine Warfare Vessels

- DM—Minelayer, Destroyer
- DMS—Minesweeper, Destroyer
- MCS—Mine Warfare Command & Support Ship
- MHC—Minelayer, Coastal
- MMF—Minelayer, Fleet
- MMA—Minelayer, Auxiliary
- MMC—Minelayer, Coastal
- MSA—Minesweeper, Auxiliary
- MSC(O)—Minesweeper, Coastal (old)
- MSC—Minesweeper, Coastal (nonmagnetic)
- MSF—Minesweeper, Fleet (steel hulled)
- MSO—Minesweeper, Ocean (nonmagnetic)

• Patrol Vessels

- DE—Escort Vessel
- DER—Radar Picket Escort Vessel
- PC—Submarine Chaser (173')
- PCE—Escort (180')
- PCER—Rescue Escort (180')
- PCS—Submarine Chaser (136')
- PF—Patrol Escort



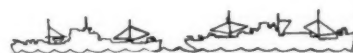
- PGM—Motor Gunboat
- PR—River Gunboat
- PY—Yacht
- SC—Submarine Chaser (110')

Auxiliary Vessels

- AD—Destroyer Tender
- ADG—Degaussing Vessel
- AE—Ammunition Ship
- AF—Store Ship
- AG—Miscellaneous
- AGB—Icebreaker
- AGP—Motor Torpedo Boat Tender
- AGS—Surveying Ship
- AGSC—Coastal Surveying Ship
- AG(SS)—Auxiliary Submarine
- AH—Hospital Ship
- AK—Cargo Ship
- AKD—Cargo Ship, Dock
- AKL—Light Cargo Ship
- AKN—Net Cargo Ship
- AKS—General Stores Issue Ship
- AKV—Cargo Ship and Aircraft Ferry
- AN—Net Laying Ship
- AO—Oiler
- AOG—Gasoline Tanker
- AOR—Replenishment Fleet Tanker
- AP—Transport
- APB—Self-propelled Barracks Ship
- APC—Small Coastal Transport
- AR—Repair Ship
- ARB—Battle Damage Repair Ship
- ARC—Cable Repairing or Laying Ship

- ARG—Internal Combustion Engine Repair Ship

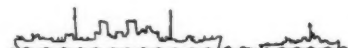
- ARH—Heavy-hull Repair Ship
- ARL—Landing Craft Repair Ship
- ARS—Salvage Ship
- ARSD—Salvage Lifting Vessel
- ARST—Salvage Craft Tender
- ARV—Aircraft Repair Ship
- ARVA—Aircraft Repair Ship (Aircraft)
- ARVE—Aircraft Repair Ship (Engine)
- AS—Submarine Tender
- ASR—Submarine Rescue Vessel
- ATA—Auxiliary Ocean Tug
- ATF—Fleet Ocean Tug
- ATR—Rescue Ocean Tug
- AV—Seaplane Tender
- AVM—Guided Missile Ship
- AVP—Small Seaplane Tender



- AVS—Aviation Supply Ship
- AW—Distilling Ship
- CVU—Utility Aircraft Carrier
- IX—Unclassified Miscellaneous

Service Craft

- AB—Crane Ship
- AFDB—Large Auxiliary Floating Dry Dock
- AFDL—Small Auxiliary Floating Dry Dock
- AFDM—Medium Auxiliary Floating Dry Dock
- APL—Barracks Ship (non-self-propelled)
- ARD—Auxiliary Floating Dry Dock
- AVC—Large Catapult Lighter
- LCU—Utility Landing Craft
- MSB—Mine Sweeping Boat
- MSI—Minesweeper, Inshore
- PT—Motor Torpedo Boat
- PYC—Coastal Yacht
- SST—Target and Training Submarine
- X—Submersible Craft



- YAG—Miscellaneous Auxiliary
- YAGR—Ocean Radar Station Ship
- YC—Open Lighter
- YCF—Car Float
- YCK—Open Cargo Lighter
- YCV—Aircraft Transportation Lighter
- YD—Floating Derrick
- YDT—Diving Tender
- YF—Covered Lighter (self-propelled)
- YFB—Ferryboat or Launch
- YFD—Yard Floating Dry Dock
- YFN—Covered Lighter (non-self-propelled)
- YFNB—Large Covered Lighter
- YFND—Covered Lighter (for use with dry docks)
- YFNG—Covered Lighter (special purpose)
- YFNX—Lighter (special purpose)
- YFP—Floating Power Barge

YFR—Refrigerated Covered Lighter (self-propelled)

YFRN—Refrigerated Covered Lighter (non-self-propelled)

YFRT—Covered Lighter (Range Tender)

YFT—Torpedo Transportation Lighter

YG—Garbage Lighter (self-propelled)

YGN—Garbage Lighter (non-self-propelled)

YHB—House Boat

YM—Dredge

YMP—Motor Mine Planter

YMS—Auxiliary Motor Mine Sweeper

YNG—Gate Vessel

YO—Fuel Oil Barge (self-propelled)

YOG—Gasoline Barge (self-propelled)

YOGN—Gasoline Barge (non-self-propelled)

YON—Fuel Oil Barge (non-self-propelled)

YOS—Oil Storage Barge

YP—Patrol Vessel

YPD—Floating Pile Driver

YPK—Pontoon Stowage Barge

YR—Floating Workshop

YRB—Submarine Repair and Berthing Barge

YRBM—Submarine Repair, Berthing and Messing Barge

YRDH—Floating Dry Dock Workshop (Hull)

YRDM—Floating Dry Dock Workshop (Mach)

YRL—Covered Lighter (Repair)

YSD—Seaplane Wrecking Derrick

YSR—Sludge Removal Barge

All-Navy Cartoon Contest—
P. B. Kincade, PNC, USN.



"This is my cousin Harvey . . . He's on a PT boat."

DIRECTIVES IN BRIEF

This listing is intended to serve only for general information and as an index of current Alnavs and NavActs as well as current BuPers Instructions, BuPers Notices, and SecNav Instructions that apply to most ships and stations. Many instructions and notices are not of general interest and hence will not be carried in this section. Since BuPers Notices are arranged according to their group number and have no consecutive number within the group, their date of issue is included also for identification purposes. Personnel interested in specific directives should consult Alnavs, NavActs, Instruction and Notices for complete details before taking action.

Alnavs apply to all Navy and Marine Corps commands; NavActs apply to all Navy commands; BuPers Instructions and Notices apply to all ships and stations.

Alnavs

No. 1—Refers to administrative details of the servicewide examinations for advancement of enlisted personnel held in February.

No. 2—Announces change of pay and allowances for travel time currently authorized to personnel upon release from active duty upon detachment from last duty station. Paragraphs 44230-3 and 4 of *Navy Comptrollers Manual* is reference.

Instructions

No. 1120.22A—Concerns procedures for the administration of active duty agreements for Naval Reserve officers and invites applications from eligible officers.

No. 1520.47—Announces the establishment of a 20-week course of instruction for eligible women officers at the General Line School.

No. 1743.4—Prescribes the lecture and discussion materials to be used by the Chaplain Corps when conducting character education group instruction.

No. 5101.2—Establishes and implements an organized safety program for off-duty military personnel

throughout the Navy, directed toward the prevention of accidents arising out of the operation of privately owned motor vehicles.

Notices

No. 1416 (29 Dec)—Clarified bibliography listed for professional examinations in subjects of Military Justice, Investigations and Claims.

No. 1747 (30 Dec)—Clarified the submission of requests for Navy Relief assistance by Navy dependents when the service member is on duty overseas and his family is located in a remote area of the United States. Also listed Naval Relief Auxiliaries.

No. 1760 (30 Dec)—Announced additional information regarding provisions of the Indiana State bonus and added states not previously listed that are still making World War II bonus payments.

No. 1210 (5 Jan)—Announced changes in officer designator codes.

No. 1760 (16 Jan)—Announced the distribution of "Referral Directory for Navy Veterans' Counselors" NavPers 15832, revised Dec. 1955.

No. 1742 (16 Jan)—Announced voting information for members of the Armed Forces to obtain ballots and vote in primary elections held in Louisiana, Minnesota and New Hampshire.

No. 1133 (17 Jan)—Informed commands of the location of all Navy Career Appraisal Teams and announced steps to be taken to promote maximum use of existing teams.

No. 1520 (17 Jan)—Promulgated information and procedure regarding participation of commissioned naval and Marine Corps officers and midshipmen of the U. S. Naval Academy (classes of 1956 and 1957) in the annual Rhodes Scholarship competition.

No. 1520 (18 Jan)—Invited applications from Supply Corps officers for assignment to the Freight Transportation and Traffic Management course at Naval Supply Center, Oakland, Calif.

QUIZ AWEIGH ANSWERS

QUIZ AWEIGH is on page 45.

1. (b) F4D Skyray.
2. (a) Delta.
3. (a) Air controlman.
4. (b) 1948.
5. (c) TBM Avenger.
6. (b) Torpedo bomber.

Course for Women Line Officers Started at Postgraduate School

A 20-week General Line School course of instruction for career women officers of the line has been instituted at the U.S. Naval Postgraduate School, Monterey, Calif.

The new course will be aimed at women officers of the line who have completed from five to seven years of commissioned service with as many women officers being assigned to the school as is feasible.

The first class started on 6 Feb 1955, and following classes will commence about June and September this year with a firm calendar being established before 1957.

Navy's Own Museum Tells Long Story of the Sea Service

Naval historians and all those who are interested in the great past of the sea service had their wishes fulfilled when the Truxtun-Decatur Naval Museum first opened in Washington, D. C. In the five and a half years since the day it started operations, back in May 1950, Truxtun-Decatur has been a focal point for Navymen, civilians, students and visitors of all walks of life who have an interest in the Navy and American history.

The museum, at 1610 H Street, N.W., has held a dozen historical exhibitions. Visitors have seen weapons and ships, uniforms and charts, books and models—all part of the collection, or loaned by Naval-minded citizens for purposes of showing others the part the Navy has played in the history of our country.

The latest exhibition is a "Pageant of Naval History." Its purpose, in the words of RADM John B. Heffernan, usn (Ret.), Director of Naval History, is "to tell the story of the United States Navy from 1775 to 1955."

The "Pageant of Naval History" had its debut before an eminent group of viewers, including Fleet Admiral William D. Leahy, President of the Naval Historical Foundation, Admiral Arleigh A. Burke, Chief of Naval Operations, and Commodore Dudley W. Knox.

Truxtun-Decatur Naval Museum, fast becoming a mecca for Navymen who visit the nation's capital, is open from noon to 1700 all days except Mondays, and on Saturdays opens at 1030.

The Truxtun-Decatur Naval Museum is housed on the estate of the historical Decatur House, owned by Mrs. Truxtun Beale. The museum is in a former carriage house, leased to the Naval Historical Foundation for 50 years.

If you have wondered about the accuracy of ALL HANDS illustrations, we'll let you in on a secret. Our artists very often go over to Truxtun-Decatur to sketch the "real thing."

Choice Shore Billets Available; Shortages for Certain Rates Exist in Many Stateside Areas

Some of the finest shore duty billets in the Navy are going begging because not enough men are requesting duty in areas where they have not previously been stationed. Qualified Fleet sailors are urged to submit their shore duty requests for assignment to areas where their services are needed so that activities in these areas will be staffed with men who desire that particular type of duty.

If you are already on the BuPers Shore Duty Eligibility List and if the list is not moving as fast as you would like, you can get ashore faster by changing your duty preference to an area where a shortage in your rating exists. This can be done by submitting a new shore duty request card (NavPers 2416) marked "Corrected Card" that indicates your new choices.

Eligible enlisted personnel who request shore duty in geographical areas where vacancies exist for their rates may be ordered ashore within a few months after their shore duty requests are processed by BuPers.

Commissarymen first class with job code classifications of "Supervisor" should indicate a secondary code on their cards. This should be their earlier specialty as either cook, butcher, baker, etc. There are few shore billets for CS1 Supervisors, and many are being detailed according to their earlier specialty.

The best shore duty opportunities are currently in the Fifth Naval District, which includes Virginia, Maryland, West Virginia and Kentucky; the Sixth Naval District which covers North Carolina, South Carolina, Tennessee, Georgia, Alabama, Mississippi and Florida; and in the Eighth Naval District, which includes Texas, Arkansas, Louisiana, Oklahoma and New Mexico. Other naval districts have limited openings.

If you are eligible, the fastest way to get ashore is to indicate that you will accept duty "anywhere in U.S." on your shore duty request card.

Here's a list of the geographical areas where vacancies for the indicated rates currently exist:

DISTRICTS WHERE VACANCIES EXIST	
RATE	
QMC	6
RD2	6, 8, 11, 12

TMC	6, 9
TM3	1, 13
FT2	5, 6, 8
MNC	1, 4, 6
MM1	1, 3, 5, 13
MM2	1, 5
MM3	5, 13
MNSN	12, PRNC
ET2	5, 6, PRNC
ET3	1, 5, 6, 11, PRNC
OMC	9
TE3	11
RM3	11, 12
RMSN	5, 11, PRNC
YN3	1, 5, 6, 11, 12, PRNC
YNSN	3, 8, 9, PRNC
PNC	5, 8, 9, 11
PN1	8, 9, PRNC
PN2	11
PN3	5, 8, 11, 12, 13, PRNC
DK3	5
CSC	8
CS3 (Cook)	1, 5, 11
CS2 (Butcher)	1, 3, 5, 6, 11, 12, 13, PRNC
CS3 (Butcher)	1, 4, 5, 6, 9, 11, 12, PRNC
JO3	5, 6, 8, 9, 11, PRNC
DM2	5, 6, 8, 9, 11, PRNC
DM3	5, PRNC
MM2	6, 11, 12, PRNC
ENC	PRNC
MR2	5, 6, 8, 9, 11, 12, 13, PRNC
EMC	1, 6, 8, 11, 12, PRNC
EM1	6
EM2	5, 6, 11
EM3	5, 12, 13, PRNC
IC1	6, 8
IC2	5, 6, 11, 12, 13
IC3	8
MEC	8, 11
ADC	PRNC
AD3	PRNC
AL3	5, 12
ALAN	4, 5, 9, 11
AM3	5, 8, PRNC
AMAN	6, 8, 11, PRNC
PRC, PR2, PR3	6, 8
AK2	1, 11, PRNC
AK3	3
PH1	5
PH2	11
PH3	4, PRNC
PHAN	PRNC

All-Navy Cartoon Contest — W. R. Maul, CTSN, USN.



"Well Dutton, I'll see what I can do about getting you a gun with a louder 'Boom!' than Johnson's."

BOOKS: PLENTY OF SALT FLAVORS THIS MONTH'S SELECTION

A BLUE-WATER SAILOR, Cyrus L. Day is a professor of English who knows the sea and salty subjects. In his *Art of Knotting and Splicing*, published by the U. S. Naval Institute, he has succeeded in bringing to life a subject which, in less skilled hands, has frequently created more indifference than interest. Every Navyman who is fortunate enough to find a copy in his ship or station library will thoroughly enjoy this handsome and authentic book on one of man's most ancient arts.

In this second edition (the first was published by Dodd, Mead & Co. in 1947 and followed *Sailor's Knots*, published in 1935), the Introduction consists of a readable and entertaining history and folklore of knots. Their use in ancient medicine, the charms and taboos associated with them, and their value in primitive arithmetic and communications are described. Mr. Day brings together briefly the essential conclusions of careful scientific research on the strength and security of knots and provides concise definitions of the terms related to the art, and explains the use of the various tools common in rope work.

Then, for some 200 pages, he leads you on from the most elementary loop through the most complex Turk's-head. No matter what your rate, you'll find yourself unconsciously reaching for the handiest piece of line so that you, too, can match your skill against Mr. Day's concise explanations and detailed and accurate photographs.

Another volume which has been selected by the Bureau of Naval Personnel library staff for limited circulation to those larger libraries and activities which require the book in their professional work is Jane's *All the World's Aircraft, 1955-56*. Emphasis in this new edition is on gas turbine power and guided missiles.

The present edition, which covers both military and commercial aircraft, contains more than 1000 photographs and line drawings and 410 pages of text, which is 30 pages longer than the preceding edition. The section covering military and

commercial aircraft contains 282 pages, has 724 illustrations, of which more than one-half are new. American aircraft occupies 108 of these pages with 276 illustrations, of which 70 per cent are new. Twenty-nine countries are represented in this portion of the book.

Other sections include markings of the air forces of the world, a list of official world records and considerable commercial data. A generous portion of the book is devoted to information about gas turbine engines and piston engines, and there is a brief section on the lighter-than-air craft of the U. S. Navy.

Enough of technical books, however readable. An approach which is markedly different than the usual treatment of the Revolutionary War may be found in Helen Augur's *Secret War of Independence*. Instead of telling about Paul Revere's ride and Washington's winter at Valley Forge, she presents the thesis that the backstage war of diplomacy, rumor, dummy corporations, double-dealing, secret agents and smear campaigns was as deadly and vital as the more overt military war.

Benjamin Franklin was, according to Miss Augur, the hero emerging in this gloryless war. He connived at the seizure of an English packet in order to drive England into war at the wrong time. With psychological method and deliberate military use of French ports, he won the support of France, Spain and Holland; his genius in using a private export firm as a front netted the Colonial cause a sizeable fortune.

Franklin's second in command was Silas Deane who, like the economic wizard Robert Morris, emerges as a new concept of the Revolutionary hero. Into this three-man cabinet of skullduggery was thrust Arthur Lee whose most trusted secretaries were invariably, strangely enough, in the pay of King George.

The author portrays Arthur Lee as one of the villains of the Revolution. He was a member of a certain group that actively sought the ruin of leaders such as Washington and Jefferson and in doing so, caused great injury to the cause of independence.

This is one of the books which

leads you to believe that truth can not only be stranger than fiction but much more exciting. Rich in odd and unexpected information, it makes enjoyable reading.

However, fiction also has its virtues, many of which are well illustrated in *The Three Legions* by Gregory Solon. The Roman legions were trained to the highest peak of military proficiency but they had one fatal weakness—they were trained only for fighting on their own terms and they had to win. They couldn't take it when they were on the losing side.

Three Legions is an unusual story of defeat—perhaps the first major Roman defeat. It started when the Germans forced a renewal of the border wars at the instigation of Arminius, who had been sent to Rome to be trained, who hated and admired Rome and all its works, and who trained German mercenaries so that he might turn them against the Romans when the time came.

It is his story, but it is also the story of the Roman legions and the men who made them out on the front line of conquest, arrogantly sure that any town was theirs for the taking. It is primarily a story of the legions' men, and their adversaries.

SONGS OF THE SEA



Our Boatswain

Ben Backstay was our boatswain,
A very merry boy,
For no one half so merrily
Could pipe all hands ahoy,
And when unto his summons
We did not well attend
No lad than he more merrily,
Could handle the rope's end.

about
'Boom!'

ANDS

MARCH 1956

59

CHINA LAKE

navy in the desert
is guided missile laboratory



"IN THE GUIDED MISSILES FIELD the Navy is just now crossing the threshold into a field which promises to revolutionize navies as much as did the discovery of gunpowder."
— Secretary of the Navy Charles S. Thomas. This is the story of NOTS China Lake, which has performed and will continue to perform a major role in the development of these weapons of the future.

A land of shimmering moon mirages, burning sands, broken hills and winding passes. Distant twisting trails once followed by the determined early explorers and settlers along the floor of the deadly Mojave and Indian Wells Valley. Long and slow shadows stretching lazily from the towering peaks of the high Sierra Nevadas. An area of mystery and challenge disturbed only by the pounding of the hooves of wild horses.

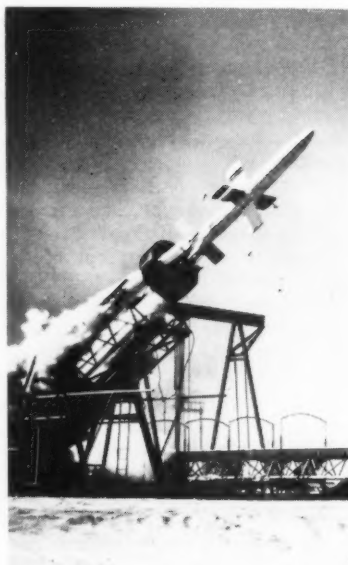
THAT WAS THE SCENE IN 1942. Today, a traveller at China Lake would find a modern, trim and prosperous community of more than 10,000 people. Trees and lawns have appeared like magic within these few years, spreading an emerald carpet of green in the midst of the desert vastness.

Known officially as the U. S. Naval Ordnance Test Station (and informally as NOTS), China Lake is the Navy's largest ordnance research and development center. Work at this permanent field station of the Bureau of Ordnance provides the Navy and other fighting forces of this country with rockets, guided missiles, torpedoes and aircraft fire-control systems.

Civilian scientists and engineers originate ideas on new weapons and carry these ideas through the development cycle to the completion of weapons ready for mass production.

Military personnel provide operational-know-how and bring to the attention of the Station the needs of the Fleet. This civilian-military team of some 6300 individuals is concerned not only with immediate requirements but also with weapon systems required five and 10 years from now.

NOTS is located in a number of different physical locations. The main facility at China Lake itself, covers over 1000 square miles, and is 155 miles northeast of Los Angeles in the northwestern part of the Mojave Desert. Some of the more important Station resources in this area are facilities for rocket research, development and pilot production in both the solid- and liquid-propellant fields; facilities for warhead and high-explosives research; intensive test ranges and test tracks; facilities for the development and evaluation of aircraft fire-control systems; networks of range instrumentation; data-assessment laboratories; a laboratory for providing aeroballistics data on gun-launched rocket models; a large-scale computing installation for involved computations in ballistic, chemistry,



This unclassified material has been made available to ALL HANDS through the courtesy of the editors of "Rocketeer" and the staff of the U. S. Naval Ordnance Test Station, China Lake, Calif.

and statistical studies; engineering facilities and machine shops; an all-weather test laboratory for testing ordnance items under controlled temperature and humidity conditions; a materials testing laboratory; a major air facility for providing aircraft services for development and evaluation test operations; and research laboratories equipped for investigations in the fields of chemistry, ballistics, physics and mathematics.

A few miles southeast of the main Station area is a 750-square-mile tract known as the Mojave B Range, which is used for special aircraft-rocket and gunnery firings. This area also includes the Randsburgs Wash Projectile Range, which is used for rocket- and projectile-fuze tests.

In the vicinity of Pasadena, Calif., there are several NOTS facilities known collectively as the Pasadena Annex. This is the operational center for NOTS in underwater ordnance work and is also a convenient liaison point between NOTS and industrial and scientific concerns in the greater Los Angeles area. Major parts of the Pasadena Annex include the Foothill Plant in Pasadena, which is the headquarters and chief work area for the Annex; the Morris Dam Test Range, near Azusa, which is used for torpedo water-entry and underwater-trajectory studies; and specialized facilities at Long Beach and San Clemente Island for sea range tests.

IN SPITE OF this imposing list of physical facilities, the most important asset of China Lake is its people. Men — and women — on the weapon-development team represent many different professions and trades, particularly in the scientific and engineering fields. They are specialists working together as a team that can focus its effort on difficult weapon development problems and can come up with answers needed by the military forces.

A factor of particular significance in the China Lake philosophy of operation is the importance of the individual. It is a place where ideas count, and ideas are generated best by individuals who are encouraged to use their initiative and are given opportunities to develop themselves along the lines of their individual specialties.

Before there can be new weapons there must be new ideas or new approaches to ordnance problems. The main sources of these ideas at China Lake are exploratory research programs in physics, chemistry, mathematics and ballistics. In addition, there are applied research programs aimed at improving warheads, explosives and other weapon components.

RESEARCH CENTER of the Station is contained in Michelson Laboratory, one of the largest and best-equipped building of its kind in the world. Floor space at Michelson is measured in acres, not square feet. The completely air-conditioned concrete building with its nearly 10 acres of floor space provides the room and the specialized facilities necessary for what is probably the largest and most complete group of scientists and engineers assembled in one place and devoting their entire efforts to weapon research, development, and testing.

Construction of the building was started early in 1944. Portions were ready for occupancy early in 1947, and the building was formally dedicated on 8 May



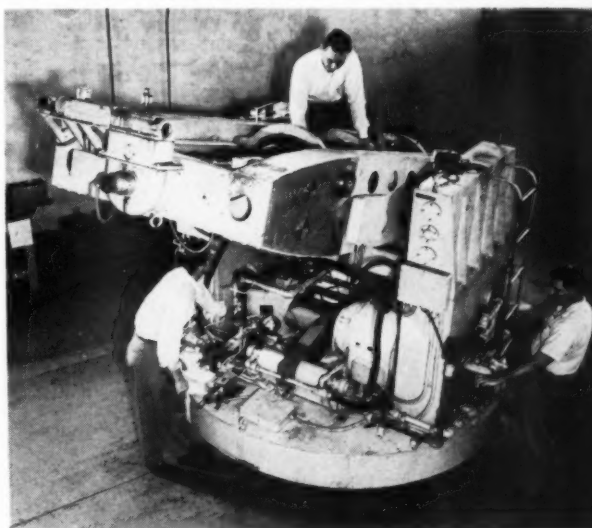
RESEMBLING A TOBOGGAN slide, the variable-angle launcher at Morris Dam (lake) tests missile's water entry.

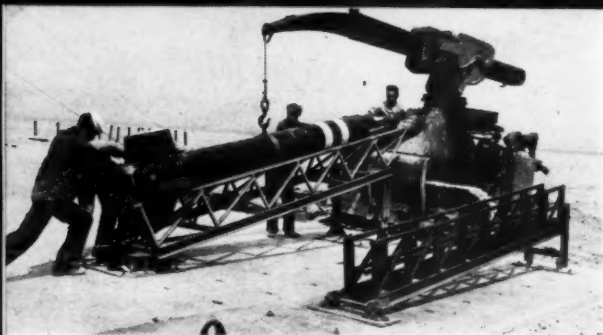
1948. It was named after Dr. Albert Abraham Michelson (1852-1931), a graduate of the U. S. Naval Academy and America's first winner of the Nobel Prize for Physics (1907). The building contains a museum housing some of Dr. Michelson's equipment used in his work in measurements relating to the interference of light and the speed of light.

The laboratory is built around a main corridor two stories high and 762 feet long, with eight one-story wings branching off this main corridor. Costing \$8,000,000, the laboratory houses approximately \$5,000,000 worth of shop, laboratory, and other technical facilities.

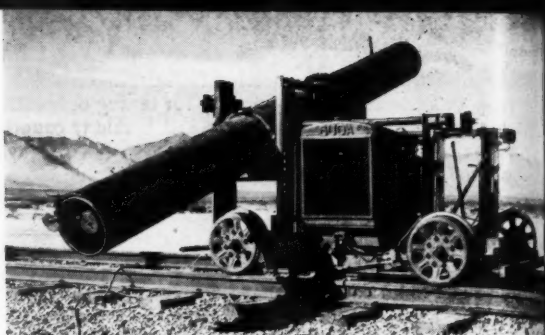
The entire building, including the roof, is constructed of concrete, and is earthquake resistant. This structure provides both the office and laboratory space and the physical equipment necessary for much of the research, development, and test evaluation work. Here the Re-

HYDRODYNAMIC SIMULATOR mechanically duplicates sea conditions torpedoes encounter, and records results.





SAILORS LOAD rocket launcher in 'old days' of '45. **Right:** Strange looking gear was target car for cross-wind testing.

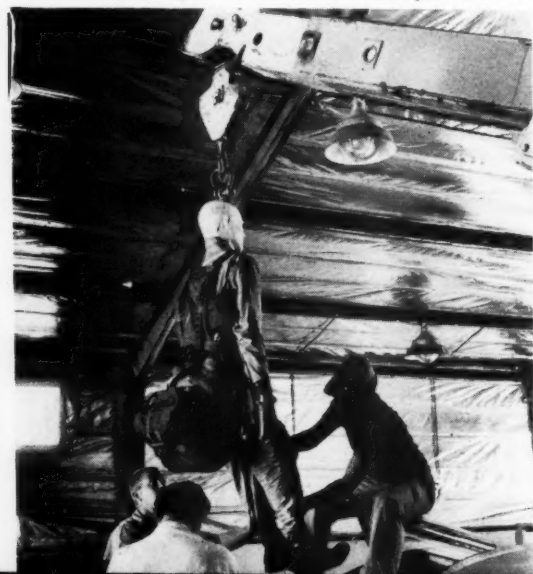


search Department has its physics and chemistry laboratories where pure and applied research is carried on in fields such as aerophysics, combustion, gas dynamics, and physical chemistry. Here, also, are the offices and laboratories of the Rocket Department where the work centers about the design and development of rockets, propellants, rocket components, launchers special instrumentation, and miscellaneous items of ordnance equipment.

Michelson Laboratory has one of the largest heat-treat furnaces installed west of the Mississippi River. There is a deep freeze machine for sub-zero treatment of metals at -120°F . There are furnaces for various heat treating operations up to 2500°F . There are gas converters for producing gases to supply the proper type of protective atmosphere in the various heat-treat furnaces to prevent oxidation and decarburization. Included is a small foundry engaged in experimental production, methods development, and foundational research in casting methods. Also, there is a plating shop which is equipped to perform all of the usual production and experimental plating operations on pieces up to $3' \times 3' \times 2'$.

A HIGHLY DIVERSIFIED MACHINE SHOP is a virtually self-sufficient facility within Michelson. It has some 185 machine tools of all types including lathes, milling machines, shapers and unusual installations such as a 400,000-pound hydraulic testing machine for tension,

'SIERRA SAM' is the name of this life sized dummy being lowered into cockpit of rocket sled for supersonic run.



compression, and bending tests of test specimens or structural parts. Nearby is a room with two-foot thick concrete walls covered with $\frac{1}{4}$ -inch of lead which houses three X-ray machines including one of 1,000,000 volts, capable of penetrating eight inches of steel. The door to the X-ray room is constructed in the same way as the walls and weighs 84,000 pounds.

The Engineering Department operates an altitude testing chamber at Michelson which can simulate a climb from sea level to 50,000 feet altitude in five minutes and dive back to sea level conditions in 33 seconds.

The "data assessment" facilities used by the Aviation Ordnance and Test Departments make possible the accurate assessment of the huge quantities of data collected on the various Station ranges. There are facilities for interpreting photographic and electronic records and a series of photographic laboratories which each year process over 2,750,000 feet of motion picture and film records and make more than 200,000 still photographic prints.

Michelson Laboratory also houses other facilities used by all of the technical departments at NOTS. These include a technical library and elaborate electronic computing equipment. The technical library contains 20,000 books and bound volumes, 75,000 technical reports, and subscribes to 450 technical journals. The computing equipment includes a high-speed, high-capacity electronic digital calculator.

SNORT IS THE SHORT NAME for the Supersonic Naval Ordnance Research Track at NOTS China Lake. The vehicles that travel this railroad, slightly more than four miles long, are rocket-powered sleds that speed down the track at over 1,000 miles per hour.

Built to bridge the gap between wind-tunnel and free-flight testing, SNORT enables researchers to test and recover full-scale missiles, rockets, airborne launchers, and aircraft components.

In operation, an item to be tested is mounted on a rocket-powered sled. The rockets are ignited, and depending upon the type of test being conducted, the sled may reach a speed as high as 3500 feet per second, quick enough to allow it to travel at this speed for over four seconds and still have 10,000 feet of track left in which to stop. A finger protruding from the bottom of the sled hits a 10,000-foot long graduated-depth trough of water between the rails, and rapidly brings the sled to a stop.

SNORT can be used for almost all types of track testing that require heavy carriage weights or high acceleration and velocity. For example, it is possible to

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test rockets, guided missiles, full-scale airplanes, or their components under conditions approximating free flight into the supersonic range. Aeroballistic tests can be made of projectiles or rockets fired or launched from the moving track carriage under simulated flight conditions.

Also, it is possible to determine aircraft damage caused by impact at high speeds into a stationary target, artificial weather, or gunfire, and to test components, such as aircraft pilot seats, parachutes, or ordnance items.

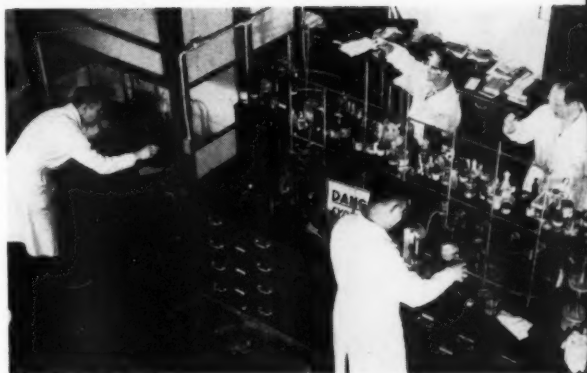
During the time that a test vehicle takes to complete its run down the track a wide variety of photographic and electronic instruments collect the data needed to analyze the performance of the item being tested. The interpretation of this data provides the information necessary to design and perfect a wide range of rockets, missiles, fire-control systems, and components of aircraft flying faster than the speed of sound.

CHINA LAKE ITSELF, home town for most employees of the Naval Ordnance Test Station, is an attractive modern community with many unique characteristics. Its population of over 10,000 makes it one of the largest towns of the Mojave Desert, yet it is one of the least known. It is a federal community established and maintained by the United States Government. The average age of its residents is lower than most towns because the community itself is young. The atmosphere is much like that of a college town because of the high percentage of residents with university degrees.

In other respects, China Lake is similar to other communities of its size. Its physical appearance is much the same; its residents join clubs, participate in civic enterprises, and amuse themselves as people do anywhere. There is a complete shopping center, including a supermarket-type commissary store, Navy Exchange, theater, library, telegraph office, bank, post office, barber shop, laundry, dry cleaners, telephone exchange, and eating establishments.

A community chapel is used by different religious denominations for church, Sunday School, and other religious services. The public-school system, covering kindergarten through high school, is among the best in California.

Evening classes for adults are particularly popular and provide educational opportunities in a wide variety of fields at both high-school and college levels. A graduate program in engineering and science subjects is offered by the University of California at Los Angeles.



NO SMOKING—Chemists work in typical lab at China Lake to develop and improve explosives in war heads.

Situated in a year-round vacationland of stark contrasts — ranging from historic Death Valley to the awe-inspiring mountain retreats in the high Sierras — China Lake is a sun-worshiper's paradise in a region romantically linked with the lusty sagas of the West.

Legends and tall tales were born in the exciting surrounding of Indian Wells Valley, that once saw the painful treks of determined emigrant trains seeking a short-cut to the California gold fields.

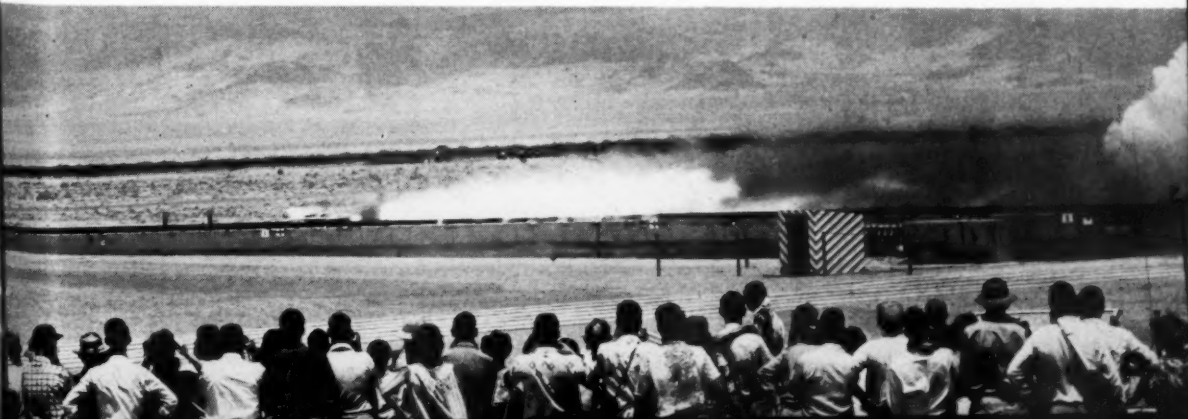
Connotations of the word "desert" have changed since the Jayhawker Party struggled across this country 100 years ago. The region has become a vacationland, the scene of dude ranches and more pretentious resorts.

People are drawn to the desert by the genial warmth of winter days and the cool evenings throughout the year. The air is clear, dry, and exhilarating.

Newcomers are surprised to learn that this particular desert teems with bird, animal, and vegetable life. In the spring it is dotted with flowers. City dwellers stream out to enjoy the spectacle and desert dwellers hold flower shows. Apart from its strange and exciting surroundings and its challenging dedication to research, China Lake is an exceptional place. Its residents enjoy the elbow room, the community associations, and the lower living costs of a small town.

That's NOTS today — working to make much of the equipment you use more effective, developing safeguards to protect the individual, and helping to bring greater power and longer range to the Navy.

ROCKET SLED ROARS down Supersonic Naval Ordnance Research Track at China Lake during a test run.



TAFFRAIL TALK

DURING THE FLOODS in Mexico last year, a young mother who was being evacuated in a Navy helicopter from HTU-1 at Ellyson Field, Pensacola, Fla., gave birth to what may literally be described as a "bouncing" baby boy.

Lieutenant John E. Gregory, Jr., USN, was flying a group of Mexicans to higher ground when one of the expectant mothers gave birth to a healthy baby boy during the flight.

For his role in piloting the "stork special" from Tampico to maternity, LT Gregory received a special award from the com-



pany that built the helicopter. He received a model of the type he was flying at the time of the unusual event. The model bears his name and an appropriate insignia—a big white stork has been painted on it to commemorate the event.

★ ★ ★

Air Development Squadron two of NAS Chincoteague, Va., can only regard the claim made in these columns (May 1955) by VP-29 regarding the wearing of gold rating badges with a certain amount of amused tolerance. A very nice record sniffs VX-2, and certainly worthy of merit.

BUT, says their CO, currently 27 CPOs are assigned to VX-2, and ALL are entitled to wear gold rating badges. They have a cumulative total of 472½ years of continuous service, which works out to an average of 17½ years per man.

In addition, eight of the VX-2 chiefs are Aviation Pilots who have flown a cumulative total of 27,708 hours in various types of aircraft, an average of 3463.4 hours per pilot.

With a figurative flexing of its biceps, VX-2 invites any other squadron to even come close to that mark.

★ ★ ★

Here's further evidence that Navy recruiters have a confusing, as well as a sometimes difficult, life.

When Tonsillitis Jackson of USS *Russell County* (LST 1090) appeared for his reenlistment, he was heartily welcomed until he received his customary physical checkup, when he was rejected.

Your guess is right. The diagnosis was tonsillitis. Prognosis, tonsillectomy and another six-year hitch.

Now, the recruiters are regarding Tonsillitis' younger brother with some apprehension. His name? Meningitis.

★ ★ ★

Getting tired of the usual excuses for being overleaver? Joseph J. Quinn, EM1, of Great Lakes, reported he was two hours late because he was bitten by a lion. He has a doctor's certificate to prove it.

The All Hands Staff

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THE BUPERS INFORMATION BULLETIN

With approval of the Bureau of the Budget on 23 Jun 1955, this magazine is published monthly by the Bureau of Naval Personnel for the information and interest of the naval service as a whole. Opinions expressed are not necessarily those of the Navy Department. Reference to regulations, orders and directives is for information only and does not by publication herein constitute authority for action. All original material may be reprinted as desired if proper credit is given ALL HANDS. Original articles of general interest may be forwarded to the Editor.

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Distribution: By Section B-3203 of the Bureau of Naval Personnel Manual the Bureau directs that appropriate steps be taken to insure that all hands have quick and convenient access to this magazine, and indicates that distribution should be effected on the basis of one copy for each 10 officers and enlisted personnel to accomplish the purpose of the magazine.

In most instances, the circulation of the magazine has been established in accordance with complement and on board count statistics in the Bureau, on the basis of one copy for each 10 officers and enlisted personnel. Because intra-activity shifts effect the Bureau's statistics, and because organization of some activities may require more copies than normally indicated to effect thorough distribution to all hands, the Bureau invites requests for additional copies as necessary to comply with the basic directive. This magazine is intended for all hands and commanding officers should take necessary steps to make it available accordingly.

The Bureau should be kept informed of changes in the numbers of copies required; requests received by the 20th of the month can be effected with the succeeding issues.

The Bureau should also be advised if the full number of copies is not received regularly.

Normally copies for Navy activities are distributed only to those on the Standard Navy Distribution List in the expectation that such activities will make further distribution as necessary; where special circumstances warrant sending direct to sub-activities the Bureau should be informed.

Distribution to Marine Corps personnel is effected by the Commandant U. S. Marine Corps. Requests from Marine Corps activities should be addressed to the Commandant.

REFERENCES made to issues of ALL HANDS prior to the June 1945 issue apply to this magazine under its former name, The Bureau of Naval Personnel Information Bulletin. The letters "NDB" used as a reference, indicate the official Navy Department Bulletin.

The United States Navy

Guardian of our Country

The United States Navy is responsible for maintaining control of the sea and is a ready force on watch at home and overseas, capable of strong action to preserve the peace or of instant offensive action to win in war.

It is upon the maintenance of this control that our country's glorious future depends. The United States Navy exists to make it so.

We Serve with Honor

Tradition, valor and victory are the Navy's heritage from the past. To these may be added dedication, discipline and vigilance as the watchwords of the present and future.

At home or on distant stations, we serve with pride, confident in the respect of our country, our shipmates, and our families.

Our responsibilities sober us; our adversities strengthen us.

Service to God and Country is our special privilege. We serve with honor.

The Future of the Navy

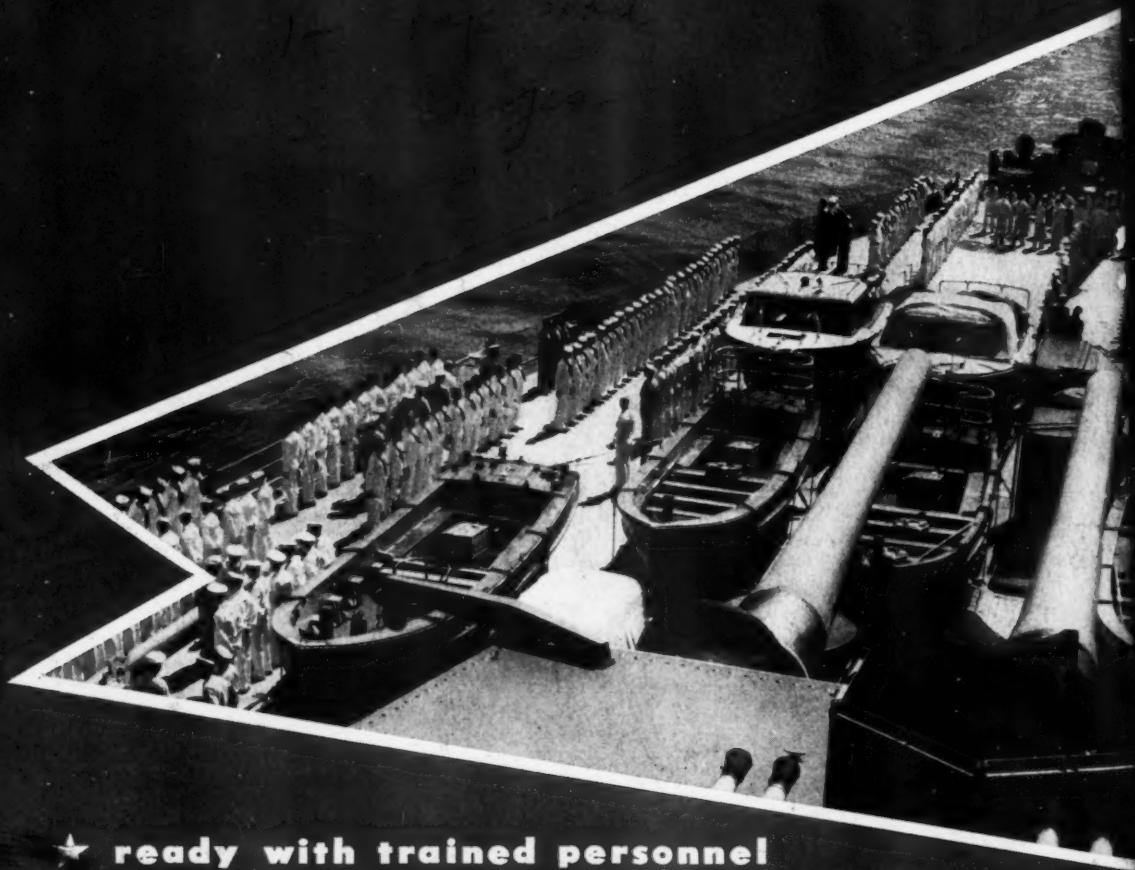
The Navy will always employ new weapons, new techniques and greater power to protect and defend the United States on the sea, under the sea, and in the air.

Now and in the future, control of the sea gives the United States her greatest advantage for the maintenance of peace and for victory in war. Mobility, surprise, dispersal and offensive power are the keynotes of the new Navy. The roots of the Navy lie in a strong belief in the future, in continued dedication to our tasks, and in reflection on our heritage from the past. Never have our opportunities and our responsibilities been greater.



"THE NAVY WILL ALWAYS BE READY"

*Admiral Arleigh A. Burke
Chief of Naval Operations*



- ★ **ready with trained personnel**
- ★ **ready with equipment**
- ★ **ready for any emergency**

